federal register

WEDNESDAY, APRIL 27, 1977

PART II

FEDERAL ENERGY ADMINISTRATION

■

ENERGY CONSERVATION PROGRAM FOR APPLIANCES

Test Procedures for Water Heaters, Television Receivers, Refrigerators, Refrigerator-Freezers, Freezers, and Clothes Dryers; Public Hearing

FEDERAL ENERGY ADMINISTRATION

[10 CFR Part 430]

ENERGY CONSERVATION PROGRAM FOR APPLIANCES

Proposed Rulemaking and Public Hearing Regarding Test Procedures for Water Heaters

AGENCY: Federal Energy Administration.

ACTION: Proposed rule.

SUMMARY: The Federal Energy Administration (FEA) proposes to amend Chapter II of Title 10, Code of Federal Regulations, in order to prescribe test procedures for water heaters, pursuant to section 323, 42 U.S.C. 6293, of the Energy Policy and Conservation Act (Act) (Pub. L. 94–163). The Act requires that standard methods for testing water heaters be prescribed as part of the energy conservation program for appliances. The intended effect of this proposal is to implement the Act's requirements for the solicitation of public comments before the test procedures are prescribed.

DATES: Comments by June 15, 1977, 4:30 p.m.; requests to speak by May 31, 1977, 4:30 p.m.; statement by June 10, 1977, 4:30 p.m.; hearing to be held on June 13, 1977, at 1:30 p.m.

ADDRESSES: Comments and requests to speak at the hearing to: Executive Communications, Room 3309, Federal Energy Administration, Box LY, Washington, D.C. 20461; statement to Regulations Management, Federal Energy Administration, Room 2214, 2000 M Street NW., Washington, D.C. 20461.

Hearing held at: Federal Energy Administration, Room 2105, 2000 M Street NW., Washington, D.C. 20461.

FOR FURTHER INFORMATION CONTACT:

James A. Smith, Room 307 Old Post Office Building 12th Street and Pennsylvania Avenue NW., Washington, D.C. 20461, 202–566–4635.

SUPPLEMENTARY INFORMATION:

A. Background

Development of test procedures is one discrete part of the energy conservation program for appliances. Even when promulgated, final test procedures will not of themselves require testing to be conducted. They will merely establish standard methods for testing when testing is otherwise required by the Act itself or by regulations implementing other parts of the program. For example, the Federal Trade Commission (FTC), in exercising its appliance energy efficiency labelling authority regarding a particular appliance type, may well require the application of substantially less than all of the final test procedures applicable to that appliance type.

By notice issued May 10, 1976 (41 FR 19977, May 14, 1976), FEA proposed to establish Part 430, entitled "Energy Conservation Program for Appliances," in Chapter II of Title 10 of the Code of Federal Regulations. That notice proposed a Subpart A to Part 430, containing general provisions, and a Subpart C, containing proposed energy efficiency improvement targets. Proposed Subparts A and C have not yet been finalized. A further proposal of Subpart C will be necessary in order to meet the requirements of section 325 (a)(1) of the Act as amended by section 161 of the Energy Conservation and Production Act (Pub. L. 94–385).

Subpart A, as previously proposed (41 FR 19977, May 14, 1976; 42 FR 15423, March 22, 1977), contained definitions in proposed section 430.2, some of which are applicable to the test procedures for water heaters. In addition, FEA is today proposing to further amend proposed § 430.2 by adding to the definition of "Basic model" a subparagraph (5) applying specifically to water heaters, by reproposing the definition of "electric water heater," and by adding definitions of "water heater," "gas water heater," and "oil water heater."

By notice issued July 22, 1976 (41 FR 31237, July 27, 1976), FEA proposed an amendment to proposed Part 430 to add a Subpart B which would contain the appliance test procedures required to be prescribed by section 323 of the Act. The notice issued July 22 described the requirements of section 323 and set forth proposed test procedures for room air conditioners. A further notice issued March 24, 1977 (42 FR 16811, March 30, 1977) solicited comments with respect to a clarification of the provision concerning the number of units to be tested. By notice issued March 17, 1977 (42 FR 15423, March 22, 1977) FEA proposed an amendment setting forth proposed test procedures for dishwashers. Test procedures for several other products are in the process of being proposed at this time.

Section 323(a)(2) of the Act requires FEA to direct the National Bureau of Standards Act (NBS) to develop for 13 types of covered products test procedures for the determination of the estimated annual operating costs and at least one other useful measure of energy consumption which FEA determines is likely to assist consumers in making purchasing decisions. Pursuant to the Act, ERA directed NBS to develop test procedures for FEA's use in prescribing test procedures under the Act. As part of this undertaking, NBS was required to evaluate existing test procedures for measuring energy consumption of water heaters.

NBS has transmitted to FEA a test procedures review document which reviewed existing test procedures for measuring energy consumption for water heaters and recommended test procedures. Copies of this review document will be made available for inspection by interested persons as provided for later in this notice.

Under the Department of Commerce Voluntary Labelling Program, proposed test procedures and labeling procedures for water heaters were published as Voluntary Specification No. 5–75 on August 14, 1975. A final specification was prepared in December 1975. Final publication of these voluntary procedures was withheld upon enactment of the Act. These test methods were developed at NBS with cooperation from the Gas Appliance Manufacturers Association. These tests are based on the American National Standards (ANSI) Z21.10.1 Gas Water Heaters and C72.1 Electric Water Heaters. The test procedures proposed today differ from the Voluntary Labelling Program test procedures in that all tests can now be run consecutively without emptying the storage tank, the tank is pre-heated, the daily water usage is different, and oil-fueled water heaters have been included. These changes are expected generally to reduce the testing burden on manufacturers.

B. Measures of Energy Consumption

The Act requires FEA to prescribe test procedures for the determination of estimated annual operating costs and at least one other useful measure of energy consumption which the Administrator determines is likely to assist consumers in making purchasing decisions. The estimated annual operating cost, proposed for both electric water heaters and gas or oil water heaters in § 430.22(e)(1), is based upon daily energy consumption, a representative average use cycle of 365 days (representing the total number of days in a year), and representative average unit energy costs.

Also proposed (§ 430.22(e)(2)) as test procedures for the determination of other measures of energy consumption which are likely to assist consumers in making purchasing decisions are test procedures regarding the energy factor for water heaters. The energy factor is defined as the daily water heating energy to the daily energy consumption. The daily water heating energy represents the heat content of the average amount of water provided by the water heater per day. Among other possible applications, the energy factor may be used by FEA to determine the efficiency of hot water heaters for the purposes of the efficiency improvement program described by section 325 of the Act.

An additional proposed measure (§ 430.22(e)(3)) that is likely to assist consumers in making purchasing decisions is the hot water supply rating which is a measure of the amount of water that can be supplied by the water heater in a given period of time.

FEA recognizes that there may be additional useful measures of energy consumption for water heaters other than the measures described above. Accordingly, today's proposal, in proposed § 430.22(e)(4), provides for other useful measures which the Administrator determines are likely to assist consumers in making purchasing decisions. These measures, however, must be derived from the application of the uniform test method proposed today as Appendix E to Subpart B. Water heater manufacturers would, if required, only have to perform various computations while still applying only the same test method contained in Appendix E. For example, if the Ad-

ministrator determined that the annual energy consumption for a water heater would aid consumers in making purchasing decisions, the annual energy consumption could be derived by applying the uniform test method for determining annual operating cost and dividing by the representative average unit cost of energy.

C. LABORATORY METHODOLOGY

Proposed Appendix E to Subpart B provides for a controlled laboratory environment for measuring energy consumption for the various water heaters that are available to the consumer. In establishing the appropriate laboratory environment, the test procedure describes air and water temperatures and test equipment configurations to assure repeatable test results. The tests will measure key operating characteristics of the water heater from which energy consumption, energy efficiency, and annual energy operating costs can be derived. The primary characteristics measured are the recovery efficiency and the standby loss. The recovery efficiency is a measure of how efficiently the water heater replaces heated water which has been removed from the tank. The standby loss is a measure of how efficiently a water heater stores heated water. Measured standby loss and recovery efficiency are then used with an assigned temperature rise and hot water usage rate to calculate annual energy consumption and energy efficiency. The assigned temperature rise and hot water usage rate will serve to standardize data on appliance labels and correlate with the energy consumption of water heaters in typical home usage, as measured by utility companies in various parts of the United States.

The total energy consumption calculated for the water heater system is based on the use of 64.3 gallons per day and a 90° F temperature rise. These numbers are used as the reference "typical" water heater without heat traps installed in the piping system. Piping losses are included in the calculated energy and are accounted for in the coeffcients used (i.e., the 64.3 gallons per day and 90° F rise). The baseline water heating system configuration is essentially a water heater without an integral heat trap, and with a piping system characterized by vertical pipe risers from the cold water inlet and hot water outlet of the water heater. Uninsulated piping losses can be reduced by using a heat trap on both the inlet and outlet wat(pipes. Laboratory tests at NBS have shown that a 12 watt savings can be obtained by a heat trap on the inlet side (cold water pipe) and 16 watts on the outlet side (hot water pipe). The heat trap reduces piping losses by preventing hot water movement out of the water heater which then cools and returns through the pipe to the water heater thus setting up a natural convection flow of water (i.e., hot water rising up to displace the cold water returning down the pipe). If the piping system is well insulated, the heat trap does not offer any additional savings. However, the typical installation today is one with uninsulated piping and a vertical pipe used for the cold water inlet and hot water outlet.

In the calculation for annual energy consumption full credit is given for the heat trap if it is an integral part of the water heater or if the heat trap is shipped separately. This adjustment for the energy savings for heat traps is calculated rather than measured because NBS tests have indicated that the amount of energy saved is fairly constant for all types of water heaters.

D. REPRESENTATIVE AVERAGE-USE CYCLE

Section 323(b)(2) (42 U.S.C. 6293(b)(2)) of the Act provides that test procedures for determining estimated annual operating costs of any covered product shall be calculated from measurements of energy use in a representative average-use cycle (as determined by the Administrator) and from representative average unit costs (as provided by the Administrator) needed to operate such product during such cycle. FEA has determined that the representative average-use cycle for water heaters is 365 days per year, since water heaters typically are used every day of the year.

Typical, or standard, values for the representative average volume of hot water usage and temperature rise occurring in producing hot water also are necessary elements in the estimated annual operating cost and the energy factor of water heaters. FEA is using 64.3 gallons per day and 90° F temperature rise for these two values, respectively, in the test procedures proposed today. The 90° F temperature rise represents the national average inlet water temperature for the U.S. of 55° F and the usual factory thermostate setting of 145° F. Normally, at the factory, gas and oil water heater thermostats are set at 140° F and electric water heater thermostats are set at 150° F. The 64.3 gallons per day of hot water was derived from information obtained from a survey conducted by NBS, of a number of gas and electric utility companies regarding hot water energy usage data. Data supporting these usage conditions are available in the NBS test procedure review document as provided for later in this notice.

FEA intends to develop representative average unit costs of energy needed to calculate the annual operating cost for the representative average use cycle and to provide this information to manufacturers and the FTC on or before the effective date of test procedures for water heaters.

E. NUMBER OF UNITS TO BE TESTED

Proposed § 430.23(e) would provide for sampling of each basic model to be tested when testing of water heaters is required by the Act or by program regulations of agencies responsible for administering the Act. This provision is intended both to provide an acceptable level of assurance that test results are applicable to any entire basic model for which testing is required and to minimize the testing burden on manufacturers. FEA believes that the sampling approach proposed today will enable consumers to make meaningful comparisons of information appearing on appliance labels, and also will meet the requirements of section 323(b) of the Act that test procedures not be unduly burdensome to conduct.

Under proposed § 430.23(e), a sample of sufficient size of each basic model would be tested to assure that, for each measure of energy consumption described in § 430.22(e), there is a 90 percent probability that the mean of the values of these measures of the sample is within 10 percent of the true mean of these measures of the basic model. The size of the sample of a particular basic model will depend upon the following factors:

(a) The level of confidence required (set at 90 percent in the proposed regulations);

(b) The maximum allowable difference between the sample mean and the mean of the basic model (expressed in the proposal as a percent of the true mean and set at 10 percent); and

(c) The relationship of the mean and standard deviation of the basic model.

The relationship of the mean and standard deviation of the basic model can be determined from data available to manufacturers. With this information and using standard statistical techniques, manufacturers can determine the number of units required to be tested. In any case, no fewer than 3 units of each basic model must be tested. Sample units would be selected randomly from the production stream.

Manufacturers and other interested persons are encouraged to comment on the sampling approach. Manufacturers are especially encouraged to submit any data which relates to the size of the samples which the provision would require to be tested. Comments alleging that the sampling provision is burdensome should include a full discussion of the facts upon which such allegation is based.

F. REQUEST FOR PARTICULAR COMMENTS

While FEA is soliciting comments on all aspects of the proposed test procedures for water heaters, FEA is particularly interested in receiving comments on any other useful measures of energy consumption or data on typical consumer usage of water heaters in adidtion to those proposed today.

In addition, FEA is interested in receiving comments on any definitions described in previously proposed § 430.2, as these provisions might affect the testing of water heaters. Comments with respect to water heaters regarding provisions in previously proposed § 430.2 are timely until the close of the written record, as specified below.

G. COMMENT PROCEDURE

1. WRITTEN COMMENT

Interested persons are invited to participate in this rulemaking by submitting data, views or arguments with respect to the proposed test procedures for water heaters set forth in this notice to Execu-

tive Communications, Room 3309, Federal Energy Administration, Box LY, Washington, D.C. 20461.

Comments should be identified on the outside of the envelope and on documents submitted to FEA with the designation "Water Heaters—Proposed Test Procedures." Fifteen copies should be submitted. All comments received by June 15, 1977, before 4:30 p.m., e.s.t., and all other relevant information, will be considered by FEA before final action is taken on the proposed regulations.

Any information or data considered by the person furnishing it to be confidential must be so identified and submitted in writing, one copy only. FEA reserves the right to determine the confidential status of the information or data and treat it according to its determination.

2. PUBLIC HEARINGS

a. *Request procedure.* The time and place of the public hearing are indicated at the beginning of this preamble.

FEA invites any person who has an isterest in the proposed rulemaking issued today, or who is a representative of a group or class of persons that has an interest in today's proposed rulemaking, to make a written request for an opportunity to make an oral presentation. Such a request should be directed to the address indicated at the beginning of this preamble and must be received before 4:30 p.m., e.s.t., on May 31, 1977. Such a request may be hand delivered to such address, between the hours of 8 a.m. and 4:30 p.m., Monday through Friday. A request should be labeled both on the document and on the envelope "Water Heaters—Proposed Test Procedures."

The person making the request should briefly describe the interest concerned; if appropriate, state why she or he is a proper representative of a group or class of persons that has such an interest; and give a concise summary of the proposed oral presentation and a telephone number where she or he may be contacted through June 12, 1977.

FEA will notify, before 4:30 p.m., June 2, 1977, each person selected to appear at a hearing. Each person selected to be heard must submit 50 copies of her or his statement to the address and by the date given in the beginning of this preamble. In the event any person wishing to testify cannot meet the 50 copy requirement, alternative arrangements can be made with the Office of Regulations Management in advance of the hearing by so indicating in the letter requesting an oral presentation or by calling the Office of Regulations Management at 202–254–3345.

b. *Conduct of hearings.* FEA reserves the right to select the persons to be heard at this hearing, to schedule their respective presentations and to establish the procedures governing the conduct of the hearing. The length of each presentation may be limited, based on the number of persons requesting to be heard.

An FEA official will be designated to preside at the hearing. This will not be a judicial or evidentiary-type hearing. Questions may be asked only by those conducting the hearing, and there will be no cross-examination of persons presenting statements. Any decision made by FEA with respect to the subject matter of the hearing will be based on all information available to FEA. At the conclusion of all initial oral statements, each person who has made an oral statement will be given the opportunity if she or he so desires, to make a rebuttal statement. The rebuttal statements will be given in the order in which the initial statements were made and will be subject to time limitations.

Any interested person may submit questions to be asked of any person making a statement at the hearing to Executive Communications, FEA, before 4:30 p.m., e.s.t., June 9, 1977. FEA will determine whether the question is relevant, and whether the time limitations permit it to be presented for answer.

Any person who makes an oral statement and who wishes to ask a question at the hearing may submit the question, in writing, to the presiding officer. The presiding officer, will determine whether the question is relevant, and whether the time limitations permit it to be presented for answer.

Any further procedural rules needed for the proper conduct of the hearing will be announced by the presiding officer.

A transcript of the hearing will be made and the entire record of the hearing, including the transcript, will be retained by FEA and made available for inspection at the FEA Freedom of Information Office, Room 2107, Federal Building, 12th and Pennsylvania Avenue NW., Washington, D.C., between the hours of 8 a.m. and 4:30 p.m., Monday through Friday. Any person may purchase a copy of the transcript from the reporter. A copy of NBS' recommendations concerning test procedures for water heaters will also be made available for inspection at the FEA Freedom of Information Office.

H. ENVIRONMENTAL AND INFLATIONARY REVIEW

As required by section 7(c)(2) of the Federal Energy Administration Act of 1974 (Pub. L. 93–275), a copy of this notice has been submitted to the Administrator of the Environmental Protection Agency for his comments concerning the impact of this proposal on the quality of the environment. The Administrator has no comments.

The National Environmental Policy Act of 1969 requires FEA to assess the environmental impacts of any proposal by the Agency for "major Federal actions significantly affecting the quality of the human environment." Since test procedures under the conservation program for appliances will be used only to standardize the measurement of energy usage and will not affect the quantity or distribution of energy usage, FEA has determined that the action of prescribing test procedures, by itself, will not result in any environmental impacts. On this basis, FEA has determined that, with respect to prescribing test procedures under the conservation program for appliances, no environmental impact statement is required.

The proposal has been reviewed in accordance with Executive Order 11821 as amended by Executive Order 11949, and OMB Circular No. A–107 and has been determined not to be a major proposal requiring evaluation of its economic impact as provided for therein

(Energy Policy and Conservation Act, Pub. L. 94–163, as amended by Pub. L. 94–385; Federal Energy Administration Act of 1974, Pub. L. 93–275, as amended by Pub. L. 94–385; E.O. 11790, 39 FR 23185)

In consideration of the foregoing, it is proposed to amend Chapter II of Title 10, Code of Federal Regulations, as set forth below.

Issued in Washington, D.C., April 21, 1977.

ERIC J. FYGI,
Acting General Counsel,
Federal Energy Administration.

1. Section 430.2 is amended by adding a subparagraph (5) as part of the definition of "Basic model," by reproposing definitions of "electric water heater," and by adding definitions of "water heater," "gas water heater," and "oil water heater" to read as follows:

§ 430.2 Definitions.

* * * * *

"Basic model" means all units of a given type of covered product manufactured by one manufacturer and—

* * * * *

(5) With respect to water heaters, having essentially identical storage capacity, energy input rating, and essentially identical functional physical and electrical characteristics.

* * * * *

"Electric water heater" means a water heater that utilizes electricity as the energy source; that has a manufacturer's specified energy input rating of 12 kilowatts or less at a voltage no greater than 250 volts, a manufacturer's specified storage capacity of not less than 30 gallons nor more than 120 gallons; and that is designed to produce hot water at a temperature less than 180° F.

* * * * *

"Gas water heater" means a water heater that utilizes gas as the energy source; that has a manufacturer's specified energy input rating of 75,000 Btu per hour or less, a manufacturer's specified storage capacity of not less than 20 gallons nor more than 100 gallons; and that is designed to produce hot water at a temperature less than 180° F.

* * * * *

"Oil water heater" means a water heater that utilizes oil as the energy source; that has a manufacturer's specified energy input rating of 172,500 Btu per hour or less, a manufacturer's specified storage capacity of 50 gallons or less; and that is designed to produce

hot water at a temperature less than 180° F.

* * * * *

"Water heater" means an automtically controlled thermally insulated vessel designed for heating water and storing of heated water, utilizing either oil, gas, or electricity as the energy source for heating water, and intended for residential use.

2. Section 430.22 is amended by adding a paragraph (e), to read as follows:

§ 430.22 Test procedures for measures of energy consumption.

* * * * *

(e) *Water heaters.* (1) The estimated annual operating cost for water heaters shall be—

(i) For an electric water heater, the product of the following three factors: (A) The representative average-use cycle of 365 days per year, (B) the average daily energy consumption in kilowatt hours per day, determined according to 4.6.1.2 of Appendix E of this subpart, and (C) the representative average unit cost in dollars per kilowatt-hour as provided by the Administrator, the resulting product then being rounded off to the nearest dollar per year, and

(ii) For a gas or oil water heater, the product of the representative average-use cycle of 365 days per year times the sum of (A) the product of the daily auxiliary electrical energy consumption in kilowatt hours per day, determined according to 4.6.2.1 of Appendix E of this subpart, times the representative average unit cost in dollars per kilowatt-hour as provided by the Administrator plus (B) the product of the daily gas or oil energy consumption in Btu's per day, determined according to 4.6.2.2 of Appendix E of this subpart, times the representative average unit cost in dollars per Btu as provided by the Administrator, the resulting product then being rounded off to the nearest dollar per year.

(2) The energy factor for water heaters shall be the quotient of daily water heating energy determined according to 4.5 of Appendix E of this subpart divided by the average daily energy consumption as determined according to 4.6 of Appendix E of this subpart, the resulting quotient then being rounded off to the nearest 0.01.

(3) The hot water supply rating, expressed in gallons, shall be determined according to 4.3 of Appendix E of this subpart.

(4) Other useful measures of energy consumption for water heaters shall be those measures of energy consumption for water heaters which the Administrator determines are likely to assist consumers in making purchasing decisions and which are derived from the application of Appendix E of this subpart.

3. Section 430.23 is amended by adding a paragraph (e), to read as follows:

§ 430.23 Units to be tested.

* * * * *

(e) *Water heaters.* (1) When testing of water heaters is required for a measure or measures of energy consumption described in § 430.22(e), a sample of sufficient size of each basic model shall be tested to ensure that, for each such measure of energy consumption, there is a 90 percent probability that the mean of the sample is within 10 percent of the true mean of such measures of the basic model, except that no fewer than three units of each basic model shall be tested.

(2) The sample selected for paragraph (e)(1) of this section shall be a simple random sample drawn from the production stream of the basic model being tested.

(3) A basic model having dual voltage ratings shall be separately tested at each design voltage such that the requirements of paragraph (e)(1) of this section are satisfied at each rating.

4. Subpart B of Part 430 is amended to add an Appendix E, to read as follows:

APPENDIX E—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF WATER HEATERS

1. DEFINITIONS

1.1 "Heat trap" means a device which can be integrally assembled or independently attached to the hot and/or cold water connections of a water heater such that a portion of this device will develop a cold water seal to minimize the natural convection and resultant heat loss of the hot water stored in the water heater.

1.2 "Recovery efficiency," expressed as a dimensionless ratio, is the ratio of heat absorbed by the water to the heat input to the heating unit during the period that water temperature is raised from inlet temperature to final temperature.

1.3 "Standby loss", expressed in hour^{-1}, is the ratio of the heat lost per hour to the heat content of the stored water above room temperature.

2. TESTING CONDITIONS

2.1 *Installation.* Install the water heater according to the manufacturer's directions, on a ¾-inch-thick plywood platform supported by three 2 x 4-inch runners. Install bends in the cold-water inlet and hot-water outlet piping so that these pipes become horizontal as close as possible to the water heater. Provide a quick-acting valve in the hot water outlet piping at a location beyond the point of temperature measurement, but as close to the water heater as possible, and arranged such that the hot water can discharge into a container and be weighed. Insulate the water inlet and outlet connections and piping which is within 4 feet of the water heater, using a material having an inverse of the overall heat transfer coefficient (R) value of not less than

$$\frac{4^\circ\ F}{Btu/ft^2\text{-}hr}$$

2.2 *Flue requirements for a gas or oil water heater.* For a gas water heater, connect to the draft-hood outlet a 5-foot vertical flue-pipe extension having a diameter equal to the largest flue-collar size of the draft hood. Perform all tests with the natural draft established by this length of flue pipe. For an oil water heater, establish a draft at the flue collar equivalent to 0.02 inch of water column.

2.3 *Water supply.* During the entire test maintain the water supply to the water heater at a temperature of between 68° F and 72° F, and at a pressure of between 40 pounds per square inch and the maximum pressure specified by the manufacturer for the water heater under test.

2.4 *Energy supply.*

2.4.1 *Electrical supply.* For an electric water heater, and for the auxiliary electrical system, if any, of an oil or gas water heater, maintain the electrical supply to the water heater within one percent of the center of its nameplate voltage range for the entire operating portion of the test cycle. Assume the heating value, Q_e, in Btu per kilowatt-hour, for electrical energy to be 3,412 Btu per kilowatt hour.

2.4.2 *Gas supply*

2.4.2.1 *Natural gas.* For a gas water heater utilizing natural gas, maintain the gas supply to the heater with a normal inlet test pressure immediately upstream of all controls at 7 to 10 inches of water column. The regulator outlet pressure at normal test pressure shall be approximately that recommended by the manufacturer. Adjust burners to their Btu ratings at normal inlet test pressure. All such adjustments shall be within ±2 percent of the hourly Btu rating specified by the manufacturer. Use natural gas with a heating value of 1,025 Btu's per standard cubic foot. Determine the actual heating value, Q_{ng}, in Btu's per standard cubic foot, for the natural gas to be used in the test, with an error no greater than 1 percent.

2.4.2.2 *Propane gas.* For a gas water heater utilizing propane, maintain the gas supply to the water heater with a normal inlet test pressure immediately upstream of all controls at 11 to 13 inches of water column. The regulator outlet pressure at normal test pressure shall be approximately that recommended by the manufacturer. Adjust burners to their Btu ratings at normal inlet test pressure. All such adjustments shall be within ±2 percent of the hourly Btu rating specified by the manufacturer. Use propane with a heating value of 2,500 Btu's per standard cubic foot. Determine the actual heating value, Q_p, in Btu's per standard cubic foot, for the propane to be used in the test, with an error no greater than 1 percent.

2.4.3 *Oil supply.* For an oil water heater utilizing fuel oil, maintain an uninterrupted supply of fuel oil to the water heater during the entire operating portion of the test cycle. Use fuel oil with a heating value of 138,500 Btu's per gallon. Determine the actual heating value Q_f, in Btu per gallon for the fuel oil to be used in the test, with an error no greater than 1 percent.

2.5 *Thermocouple installation.* Install along the center line of the water heater tank, six thermocouples (herein "center-line thermocouples"), one at the level of the center plane of each of six sections of equal volume from top to bottom of the tank. Install three inches below the highest water level in the tank, an additional thermocouple (herein "tank-top thermocouple"). Install thermocouples in both the cold-water inlet (herein "cold-water thermocouple") and the hot-water outlet (herein "hot-water thermocouple"), not more than six inches from the connections to the water heater, or, where those connections are inaccessible, at the closest accessible point to those connections. Install in the test room a thermocouple (herein "ambient air thermocouple") at a height of 4 feet from the test-room floor and at a horizontal distance of at least five feet from the water heater under test.

2.6 *Setting of tank thermostat.* Starting with a tank of unheated water, initiate normal operation of the water heater. At the time that the main heating element is turned off by the thermostat (herein "cutout"), determine whether the average of the temperatures measured by the center-line thermocouples (herein "mean center-line temperature") is between 155° F and 165° F. If not turn off the water heater, adjust the thermostat, again fill the tank with unheated water, initiate normal operation of the water heater, and determine the mean center-line temperature at cutout. Repeat this procedure until the mean center-line temperature at cutout is between the 155° F and 165° F, at which time the thermostat is properly set. If the water heater has two thermostats, set the upper thermostat to cut out at a water temperature of 160° F±5° F in the top six inches of the tank and set the lower thermostat to give an average tank water temperature of 160° F±5° F.

2.7 *Energy flow instrumentation.* Install one or more energy flow instruments which measure, as appropriate, and with an error no greater than 1 percent, the quantity of electrical energy, natural gas flow, propane flow, or fuel oil flow supplied to the water heater.

2.8 *Water flow instrumentation.* Install a flow control valve in the inlet water line downstream of the expansion tank and calibrate this flow control valve to provide a flow of 3.0±.25 gallons per minute. Provide instrumentation for measuring the volume of water withdrawn to within ±1 percent.

2.9 *Room ambient temperature.* Maintain the test room at an ambient air temperature of between 65° F and 85° F, as measured by the ambient-air thermocouples. Maintain room temperature during testing within ±7° F of the initial room temperature.

3. MEASUREMENTS

3.1 *Tank storage capacity.* Determine the storage capacity, V, of the water heater under test, in gallons, according to the method specified in 2.26 of the American National Standard for Gas Water Heaters, Volume I, designated ANS Z21.10.1-1975.

3.2 *Power input determination.* Initiate operation of the water heater, and, using the energy flow instrumentation of 2.7 and the actual heating valve of 2.4, measure the power input, P, to the burner or heating element of the water heater under test (including gas pilot light power, if any) when the heater or heaters are in operation, in kilowatts or Btu per hour, as appropriate. To the extent possible, adjust the water heater to use the power indicated by its nameplate rating before obtaining the value of P. Maintain any adjustment so made during the entire test procedure. In addition, measure the Power, P_a, if any, used by any auxiliary electrical system when the main heater is in operation, in kilowatts.

3.3 *Recovery efficiency for a gas or oil water heater.* With the water heater turned off, fill the tank with water, and eliminate any residual air remaining in the tank. Continue to flow water through the tank until the mean center-line temperature remains at 70±2° F. Record the mean center-line temperature (herein "initial mean center-line temperature"). Begin measuring fuel flow (including pilot fuel, if any), and initiate normal operation of the water heater. When cutout occurs, record the maximum mean center-line temperature (herein "maximum mean center-line temperature") and record the total fuel flow, F_t, from initiation to cutout. Record the temperature difference, D_t, obtained by subtracting the initial from the maximum mean center-line temperature.

3.4 *Standby loss.* With the water heater operating normally, such that the water temperature is established

in the range specified in 2.6, eliminate any residual air from the tank. At at a point in time immediately after a cutout such that all heating element(s) are off, begin measuring energy flow (including pilot fuel, if any), record the time as the beginning of the test period, and record the initial mean center-line temperature and the initial ambient air temperature. At the end of each time interval not exceeding 15 minutes in duration throughout the test period, record the mean center-line temperature and the ambient air temperature. Continue these measurements until the first cutout in which all heating element(s) are off following a period of at least 48 hours from the beginning of the test period. When that cutout occurs, record the time as the end of the test period, record the total energy flow, F_r, from the beginning to the end of the test period, and record the final mean center-line temperature and the final ambient air temperature. Record as the duration, t, of the standby loss test the time, in hours, which elasped from the beginning to the end of the test period. Calculate the average of the recorded values of the mean center-line temperature and the ambient air temperature taken at the end of each time interval, including in these two averages the initial and final recorded values for these temperatures. Determine the difference, D_s, between these two averages by subtracting the latter from the former, and the difference, D_r, between the final and initial mean center-line temperatures by subtracting the latter from the former.

3.5 *Hot water supply rating.* Establish normal operation of the water heater such that the water temperature is established in the range specified in 2.6. Immediately after a cutout such that all heating element(s) are off, measure the outlet water temperature (herein "initial outlet water temperature") and record the time, and begin withdrawing water from the tank into a weighing container at a rate of between 2.5 and 3.5 gallons per minute. Continue the withdrawal until the outlet water temperature drops to a value (herein "shutoff temperature") 40° F below the initial outlet water temperature, at which time terminate the withdrawal. If a cutout of any upper thermostat occurs less than one hour after the initial cutout, again withdraw water until the outlet water temperature drops to the shutoff temperature. Repeat this cycle until one hour after the initial cutout, at which time turn off all energy flow to the water heater. If the temperature measured by the tank top thermocouple at that time is higher than the shutoff temperature, withdraw water until the water outlet temperature drops to the shutoff temperature. Record the weight, W, of water withdrawn during this test, in pounds.

4. CALCULATION OF DERIVED RESULTS FROM TEST MEASUREMENTS

4.1 *Recovery efficiency.*

4.1.1 *Recovery efficiency for a gas or oil water heater.* For a gas or oil water heater, calculate the recovery efficiency, E_r, expressed as a dimensionless quantity and defined as:

$$E_r = \frac{k \times V \times D_r}{F_r \times Q},$$

where

k = nominal specific heat of water in Btu's per gallon degree F = 8.25.
V = tank capacity measured according to 3.1, in gallons.
D_r = difference between the initial and final mean center-line temperatures, measured according to 3.3, in degrees F.
F_r = total energy flow in the recovery efficiency test measured according to 3.3, in appropriate units.
Q = actual heating value, as determined in accordance with 2.4, for the appropriate energy type.

4.1.2 *Recovery efficiency for an electric water heater.* For an electric water heater, calculate the recovery efficiency, E_r, expressed as (dimensionless) quantity and defined as:

$$E_r = 1 - \frac{S \times k \times V \times \Delta a_v}{P}$$

where

k and V are as defined in 4.1.1.
S = standby loss, as calculated in 4.2, in hours^{-1}.
Δa_v = nominal average difference between the mean center-line temperature and the ambient-air temperature during recovery, in degrees F = 45.
P = water heater input power as determined in 3.2, in Btu per hour.

4.2 *Standby loss.* Calculate the standby loss, S, expressed in hours^{-1} and defined as:

$$S = \frac{F_s \times Q}{t \times k \times D_s \times V} \quad \frac{D_r}{t \times D_s \times E_r^*}$$

where Q, k, and V are as defined in 4.1.1.
F_s = total energy flow in the standby loss test, measured according to 3.4, in appropriate units.
t = duration of standby loss test, measured according to 3.4, in hours.
$E_r^* = E_r$, as calculated in 4.1, for gas or oil water heaters; or 1, for electric water heaters.
D_r = difference between the initial and final mean center-line temperatures as determined in the standby-loss test of 3.4, in degrees F and,
D_s = difference between the average value of the mean center-line temperature and the average value of the ambient air temperature during the standby-loss test, as determined in 3.4, in degrees F.

4.3 *Hot water supply rating.* Calculate the hot water supply rating, G, expressed in gallons, and defined as $G = W/d$, where
W = total weight of water withdrawn during the supply rating test of 3.5, in pounds,
d = nominal density of water in pounds per gallon = 8.25.

4.4 *Recovery rate.* Calculate the 90° F-rise recovery rate, R_{90}, expressed in gallons per hour and defined as:

$$R_{90} = \frac{P \times E_r}{k \times \Delta r}$$

where P, E_r and k are as defined in 4.1,
Δr = nominal difference between the inlet and outlet water temperatures, in °F = 90.

4.5 *Daily water heating energy.* Calculate the daily water heating energy, Z, the energy required to heat the nominal amount of hot water used daily, expressed in Btu and calculated as:

$$Z = \frac{k \times \Delta r \times U}{E_r}$$

where k, E_r are as defined in 4.1.
Δr is as defined in 4.4, and
U = nominal daily hot water usage in gallons = 64.3.

4.6 *Average daily energy consumption.* Calculate the average daily energy consumption, C.

4.6.1 Average daily energy consumption for an electric water heater.

4.6.1.1 *Average daily energy consumption for an electric water heater expressed in Btu.*

$$C_E = Z + m \times (24 - Z/P) - F_H - F_C$$

where
m = average energy required per hour to maintain stored water temperature, in Btu per hour = $S \times k \times \Delta a \times V$.
E_r, k, V, P, and S are as defined in 4.1.
Z is as defined in 4.5.
Δa = nominal difference between the mean centerline temperature and the ambient air temperature in °F = 90.
F_H = daily energy credit for a heat trap if provided for in the hot water outlet = 1,311 Btu.
F_C = daily energy credit for a heat trap if provided for in the cold water inlet = 953 Btu.

4.6.1.2 *Average daily energy consumption for an electric water heater, expressed in kilowatt-hours per day.*

$$C_{EK} = \frac{C_E}{3{,}412 \text{ Btu/kWh}}$$

C_E as defined in 4.6.1.1.

4.6.2 *Average daily energy consumption for a gas or oil water heater.*

4.6.2.1 *Daily auxiliary electrical energy consumption expressed in kilowatt hours per day.*

$$P_{ad} = \frac{P_a \times Z/P}{3{,}412 \text{ Btu/kWh}}$$

P_a = auxiliary electrical power, if any, used by the water heater as determined in 3.2, in Btu per hour.
P as defined in 4.1.
Z as defined in 4.5.

4.6.2.2 *Daily gas or oil energy consumption, expressed in Btu's per day.*

$$C_F = Z + m \times \left(24 - \frac{Z}{P}\right) - F_H - F_C$$

P as defined in 4.1.2
Z as defined in 4.5, and
F_H, F_C, m as defined in 4.6.1.

4.6.2.3 *Average daily energy consumption for a gas or oil water heater, expressed in Btu's.*

$$C_G = Z + m \times \left(24 - \frac{Z}{P}\right) + P_a \times \frac{Z}{P} - F_H - F_C$$

P as defined in 4.1.2
Z as defined in 4.5
F_H, F_C, m as defined in 4.6.1.1, and
P_a as defined in 4.6.2.1.

[FR Doc.77-11982 Filed 4-21-77;5:00 pm]

[10 CFR Part 430]

ENERGY CONSERVATION PROGRAM FOR APPLIANCES

Proposed Rulemaking and Public Hearing Regarding Test Procedures for Television Receivers

AGENCY: Federal Energy Administration.

ACTION: Proposed rule.

SUMMARY: The Federal Energy Administration (FEA) hereby proposes to amend Chapter II of Title 10, Code of Federal Regulations, in order to prescribe test procedures for television receivers, pursuant to section 323, 42 U.S.C. 6293, of the Energy Policy and Conservation Act (Act) (Pub. L. 94–1633). The Act requires that standard methods for testing television receivers be prescribed as part of the energy conservation program for appliances. The intended effect of this proposal is to implement the Act's requirements for the solicitation of public comments before the test procedures are prescribed.

DATES: Comments by June 15, 1977, 4:30 p.m.; requests to speak by May 31, 1977, 4:30 p.m.; statement by June 13, 1977, 4:30 p.m. hearing to be held on June 14, 1977, at 1:30 p.m.

ADDRESSES: Comments and requests to speak at the hearing to: Executive Communications, Room 3309, Federal Energy Administration, Box LZ, Washington, D.C. 20461; statement to: Regulations Management, Federal Energy Administration, Room 2214, 2000 M Street NW., Washington, D.C. 20461.

Hearing held at: Federal Energy Administration, Room 2105, 2000 M Street NW., Washington, D.C. 20461.

FOR FURTHER INFORMATION CONTACT:

James A. Smith, Room 307, Old Post Office Building, 12th Street and Pennsylvania Avenue NW., Washington, D.C. 20461, 202–566–4635.

SUPPLEMENTARY INFORMATION:

A. BACKGROUND

Development of test procedures is one discrete part of the energy conservation program for appliances. Even when promulgated, final test procedures will not of themselves require testing to be conducted. They will merely establish standard methods for testing when testing is otherwise required by the Act itself or by regulations implementing other parts of the program. For example, the Federal Trade Commission (FTC), in exercising its appliance energy efficiency labelling authority regarding a particular appliance type, may well require the application of substantially less than all of the final test procedures applicable to that appliance type.

By notice issued May 10, 1976 (41 FR 19977, May 14, 1976), FEA proposed to estabish Part 430, entitled "Energy Conservation Program for Appliances," in

Chapter II of Title 10 of the Code of Federal Regulations. That notice proposed a Subpart A to Part 430, containing general provisions, and a Subpart C, containing proposed energy efficiency improvement targets. Proposed Subparts A and C have not yet been finalized. A further proposal of Subpart C will be necessary in order to meet the requirements of section 325(a)(1) of the Act as amended by section 161 of the Energy Conservation and Production Act (Pub. L. 94-385).

Subpart A as previously proposed (41 FR 19977, May 14, 1976; 42 FR 15423, March 22, 1977) contained definitions in proposed § 430.2, some of which are applicable to the test procedures for television receivers. In addition, FEA is proposing to add to the definition in § 430.2 of "Basic model", a subparagraph (8) applying specifically to television receivers.

By notice issued July 22, 1976 (41 FR 31287, July 27, 1976), FEA proposed an amendment to proposed Part 430 to add a Subpart B which would contain the appliance test procedures required to be prescribed by section 323 of the Act. The notice issued July 22 described the requirements of section 323 and set forth proposed test procedures for room air conditioners. A further notice issued March 24, 1977 (42 FR 16811, March 30, 1977) solicited comments with respect to a clarification of the provision concerning the number of units to be tested. By notice issued March 17, 1977 (42 FR 15423, March 22, 1977), FEA proposed an amendment setting forth proposed test procedures for dishwashers. Test procedures for several other products are in the process of being proposed at this time.

Section 323(a)(2) of the Act requires FEA to direct the National Bureau of Standards Act (NBS) to develop for 13 types of covered products test procedures for the determination of the estimated annual operating costs and at least one other useful measure of energy consumption which FEA determines is likely to assist consumers in making purchasing decisions. Pursuant to the Act, FEA directed NBS to develop test procedures for FEA's use in prescribing test procedures under the Act. As part of this undertaking, NBS was required to evaluate existing test procedures for measuring energy consumption of television receivers.

NBS has transmitted to FEA a test procedures review document which reviewed existing test procedures for measuring energy consumption for television receivers and recommended test procedures. Copies of this review document will be made available for inspection by interested persons as provided for later in this notice. A test procedure was developed under the Department of Commerce Voluntary Program for Appliance Efficiency but was not issued due to passage of the Act. It is this test procedure that is the basis for test procedures proposed today.

B. Measures of Energy Consumption

The Act requires FEA to prescribe test procedures for the determination of estimated annual operating costs and at least one other useful measure of energy consumption which the Administrator determines is likely to assist consumers in making purchasing decisions. The estimated annual operating cost proposed for television receivers is the product of the representative average unit cost of energy times the total average annual energy consumed when the television receiver is operated in its standard operating mode. The standard operating mode of a television receiver is defined as operation with any vacation switch in its highest energy consuming position.

An additional proposed measure that is likely to assist consumers in making purchasing decisions is the receiver energy efficiency factor, which is defined as a television receiver's estimated minimum average power consumption (kilowatts) multiplied by the annual hours of use (hours/year) divided by the total average annual energy consumed (kilowatt-hours/year) by the television receiver with credit given for the use of any vacation switch. The resultant is then multiplied by 100 and expressed as a percent. The estimated minimum power consumption determined by NBS is 130 watts (.130 kilowatts) for color television receivers and 40 watts (.040 kilowatts) for monochrome television receivers. Among other possible applications, the receiver energy efficiency factor may be used by FEA to determine the efficiency of television receivers for the purposes of the efficiency improvement program described by section 325 of the Act.

The credit to be given in the energy efficiency factor to the use of a vacation switch is dependent upon the extent that the switch is actually used. While no data have been made available which reflect on the frequency of use of the vacation switch, a 50 percent frequency of use basis was established by NBS for any energy saving feature that required consumer interaction. Comments addressing this issue in the context of the initial proposed energy efficiency targets generally agreed with the NBS recommendation that a 50 percent figure for consumer usage be utilized when actual usage is unknown. FEA, accordingly, proposes to use the 50 percent energy consumption adjustment for use of vacation switches on television receivers.

FEA recognizes that there may be additional useful measures of energy consumption for television receivers other than the measures described above. Accordingly, today's proposal, in proposed § 430.22(h)(3), provides for other useful measures which the Administrator determines are likely to assist consumers in making purchasing decisions. These measures, however, must be derived from the application of the uniform test method proposed today as Appendix H to Subpart B. Television manufacturers would, if required only have to perform various computations while still applying the same test method contained in Appendix H. For example, if the Administrator determined that a per-hour cost would aid consumers in making purchasing decisions, this cost could be derived by applying the uniform test method and dividing by the annual usage to arrive at a per-hour figure.

C. Laboratory Methodology

Proposed Appendix H to Subpart B provides for a controlled laboratory environment for measuring the energy consumption of television receivers which are available to the consumer. Due to the fact that the power consumption of a television receiver is strongly dependent on the average picture luminance (brightness), the operating power consumption is computed by averaging the power measured at the maximum power consumption (standard white pattern) and at the minimum power consumption (standard black pattern). Separate measurements are made to determine the power consumption of the remote control and filament keep-warm features. Measurements are also included for the power consumed when a television receiver is in the standby or off mode. From these measurements the total average annual energy consumption for either operating mode can be calculated, using Appendix H.

D. Representative Average-Use Cycle

Section 323(b)(2) (42 U.S.C. 6293(b)(2)) of the Act provides that test procedures for determining estimated annual operating costs of any covered product shall be calculated from measurements of energy use in a representative average-use cycle (as determined by the Administrator) and from representative average unit costs (as provided by the Administrator) needed to operate such product during such cycle. FEA has determined that the representative average use cycle of television receivers is 2,200 hours of viewing time annually. This means that in a one year period, the average television receiver has an operating time of 2,200 hours and a standby or off time of 6,500 hours. This determination is based upon NBS' recommendation to FEA which, in turn, is based upon a survey conducted by the A. C. Neilsen Company to determine the national average use patterns of television receiver viewing time. NBS' recommendation and the Neilsen survey are available for inspection as provided for later in this notice.

FEA intends to develop representative average unit costs of energy needed to calculate the annual operating cost for the representative average-use cycle and to provide this information to manufacturers and FTC on or before the effective date of test procedures for television receivers.

E. Number of Units to be Tested

Proposed § 430.23(h) would provide for sampling of each basic model to be tested when testing of television receivers is required by the Act or by program regu-

lations of agencies responsible for administering the Act. This provision is intended both to provide an acceptable level of assurance that test results are applicable to any entire basic model for which testing is required and to minimize the testing burden on manufacturers. FEA believes that the sampling approach proposed today will enable consumers to make meaningful comparisons of information appearing on appliance labels, and also will meet the requirements of section 323(b) of the Act that test procedures not be unduly burdensome to conduct.

Under proposed § 430.23(h), a sample of sufficient size of each basic model would be tested to assure that, for each measure of energy consumption described in § 430.22(h), there is a 95 percent probability that the mean of the values of these measures of the sample is within five percent of the true mean of these measures of the basic model. The size of the sample of a particular basic model will depend upon the following factors:

(a) The level of confidence required (set at 95 percent in the proposed regulations);

(b) The maximum allowable difference between the sample mean and the mean of the basic model (expressed in the proposal as a percent of the true mean and set at five percent); and

(c) The relationship of the mean and standard deviation of the basic model.

The relationship of the mean and standard deviation of the basic model can be determined from data available to manufacturers. With this information and using standard statistical techniques, manufacturers can determine the number of units required to be tested. In any case, no fewer than 3 units of each basic model must be tested. Sample units would be selected randomly from the production stream.

Manufacturers and other interested persons are encouraged to comment on the sampling approach. Manufacturers are especially encouraged to submit any data which relates to the size of the samples which the provision would require to be tested. Comments alleging that the sampling provision is burdensome should include a full discussion of the facts upon which such allegation is based.

F. Request for Particular Comments

While FEA is soliciting comments on all aspects of the proposed test procedures for television receivers, FEA is particularly interested in receiving comments on any other useful measures of energy consumption or data on typical consumer usage of television receivers in addition to those proposed today.

In addition, FEA is interested in receiving comments on any definitions described in previously proposed § 430.2, as these provisions might affect the testing of television receivers. Comments with respect to television receivers regarding provisions in previously proposed § 430.2 are timely until the close of the written record, as specified below. For the convenience of the reviewer, the proposed definition of television receivers (41 FR 19979, May 14, 1976) is as follows:

Section 430.2 *Definitions.* "Color television receiver" means an apparatus designed to convert incoming broadcast signals into color television pictures with the customarily associated sound. It is or can be powered by alternating electric current and is produced primarily for residential use.

"Monochrome television receiver" means an apparatus designed to convert incoming broadcast signals into monochrome television pictures with the customarily associated sound. It is or can be powered by alternating electric current and is produced primarily for residential use.

G. Comment Procedure

1. Written comment

Interested persons are invited to participate in this rulemaking by submitting data, views or arguments with respect to the proposed test procedures for television receivers set forth in this notice to Executive Communications, Room 3309, Federal Energy Administration, Box LZ, Washington, D.C. 20461.

Comments should be identified on the outside of the envelope and on documents submitted to FEA with the designation "Television Receivers—Proposed Test Procedures." Fifteen copies should be submitted. All comments received by June 15, 1977, before 4:30 p.m., e.s.t., and all other relevant information, will be considered by FEA before final action is taken on the proposed regulations.

Any information or data considered by the person furnishing it to be confidential must be so identified and submitted in writing, one copy only. FEA reserves the right to determine the confidential status of the information or data and treat it according to its determination.

2. Public hearings.

a. *Request procedure.* The time and place of the public hearing are indicated at the beginning of this preamble.

FEA invites any person who has an interest in the proposed rulemaking issued today, or who is a representative of a group or class of persons that has an interest in today's proposed rulemaking, to make a written request for an opportunity to make an oral presentation. Such a request should be directed to the address indicated at the beginning of this preamble and must be received before 4:30 p.m., e.s.t., on May 31, 1977. Such a request may be hand delivered to such address, between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday. A request should be labeled both on the document and the envelope "Television Receivers—Proposed Test Procedures."

The person making the request should briefly describe the interest concerned; if appropriate, state why she or he is a proper representative of a group or class of persons that has such an interest; and give a concise summary of the proposed oral presentation and a telephone number where she or he may be contacted through June 13, 1977.

FEA will notify, before 4:30 p.m., June 2, 1977, each person selected to appear at a hearing. Each person selected to be heard must submit 50 copies of her or his statement to the address and by the date give in the beginning of this preamble. In the event any person wishing to testify cannot meet the 50 copy requirement, alternative arrangements can be made with the Office of Regulations Management in advance of the hearing by so indicating in the letter requesting an oral presentation or by calling the Office of Regulations Management at 202–254–3345.

b. *Conduct of hearings.* FEA reserves the right to select the persons to be heard at this hearing, to schedule their respective presentations and to establish the procedures governing the conduct of the hearing. The length of each presentation may be limited, based on the number of persons requesting to be heard.

An FEA official will be designated to preside at the hearing. This will not be a judicial or evidentiary-type hearing. Questions may be asked only by those conducting the hearing, and there will be no cross-examination of persons presenting statements. Any decision made by FEA with respect to the subject matter of the hearing will be based on all information available to FEA. At the conclusion of all initial oral statements, each person who has made an oral statement will be given the opportunity if she or he so desires, to make a rebuttal statement. The rebuttal statements will be given in the order in which the initial statements were made and will be subject to time limitations.

Any interested person may submit questions to be asked of any person making a statement at the hearing to Executive Communications, FEA, before 4:30 p.m., e.s.t., June 9, 1977. FEA will determine whether the question is relevant, and whether the time limitations permit it to be presented for answer.

Any person who makes an oral statement and who wishes to aks a question at the heearing may submit the question, in writing, to the presiding officer. The presiding officer, will determine whether the question is relevant, and whether the time limitations permit it to be presented for answer.

Any further procedural rules needed for the proper conduct of the hearing will be announced by the presiding officer.

A transcript of the hearing will be made and the entire record of the hearing, including the transcript, will be retained by FEA and made available for inspection at the FEA Freedom of Information Office, Room 2107, Federal Building, 12th and Pennsylvania Avenue NW., Washington, D.C., between the hours of 8 a.m. and 4:30 p.m., Monday through Friday. Any person may purchase a copy of the transcript from the reporter. A copy of NBS' recommendations concerning test procedures for television receivers along with a related Neilsen Survey will also be made available for inspection at the FEA Freedom of Information Office.

H. Environmental and Inflationary Review

As required by section 7(c)(2) of the Federal Energy Administration Act of 1974 (Pub. L. 93-275), a copy of this notice has been submitted to the Administrator of the Environmental Protection Agency for his comments concerning the impact of this proposal on the quality of the environment. The Administrator has no comments.

The National Environmental Policy Act of 1969 requires FEA to assess the environmental impacts of any proposal by the Agency for "major Federal actions significantly affecting the quality of the human environment." Since test procedures under the conservation program for appliances will be used only to standardize the measurement of energy usage and will not affect the quantity or distribution of energy usage, FEA has determined that the action of prescribing test procedures, by itself, will not result in any environmental impacts. On this basis, FEA has determined that, with respect to prescribing test procedures under the conservation program for appliances, no environmental impact statement is required.

NOTE.—The proposal has been reviewed in accordance with Executive Order 11821 as amended by Executive Order 11949, and OMB Circular No. A-107 and has been determined not to be a major proposal requiring evaluation of its economic impact as provided for therein.

(Energy Policy and Conservation Act, Pub. L. 94-163, as amended by Pub. L. 94-385; Federal Energy Administration Act of 1974, Pub. L. 93-275, as amended by Pub. L. 94-385; E.O. 11790, 39 FR 23185.)

In consideration of the foregoing, it is proposed to amend Chapter II of Title 10, Code of Federal Regulations, as set forth below.

Issued in Washington, D.C., April 21, 1977.

ERIC J. FYGI,
Acting General Counsel,
Federal Energy Administration.

1. Section 430.2 is amended by adding subparagraph (8) as part of the definition of "Basic model," to read as follows:

§ 430.2 Definitions.

* * * * *

"Basic model" means all units of a given type of covered product manufactured by one manufacturer and—

* * * * *

(8) With respect to television receivers, having identical screen size for color and monochrome, and essentially identical functional physical and electrical characteristics.

* * * * *

2. Section 430.22 is amended by adding a paragraph (h) to read as follows:

§ 430.22 Test procedures for measures of energy consumption.

* * * * *

(h) *Television receivers.* (1) The estimated average annual operating cost for television receivers shall be the product of—

(i) The total average annual energy consumed by the television receiver when operated in the standard operating mode in kilowatt-hours per year, determined according to 3.4.1 of Appendix H of this subpart, and

(ii) The representative average unit cost in dollars per kilowatt-hour as provided by the Administrator, the resulting product then being rounded off to the nearest dollar per year.

(2) The receiver energy efficiency factor for television receivers, expressed in percent, shall be—

(i) For color television receivers, the product of the estimated minimum power requirement (.130 kilowatts) and the average annual hours of use (2,200 hr/yr.), divided by the total average annual energy consumed by the television receiver when operated in the vacation operating mode in kilowatt-hours per year, determined according to 3.4.2 of Appendix H to this subpart. The resultant is then multiplied by 100 and expressed as a percent, and

(ii) For monochrom television receivers, the product of the estimated minimum power requirement (.040 kilowatts) and the average annual hours of use (2,200 hr/yr.), divided by the total average annual energy consumed by the television receiver when operated in the vacation operating mode in kilowatt-hours per year determined according to 3.4.2 of Appendix H of this subpart. The resultant is then multiplied by 100 and expressed as a percent.

(3) Other useful measures of energy consumption for television receivers shall be those measures of energy consumption for television receivers which the Administrator determines are likely to assist consumers in making purchasing decisions and which are derived from the application of Appendix H of this subpart.

3. Section 430.23 is amended by adding a paragraph (h), to read as follows:

§ 430.23 Units to be tested.

* * * * *

(h) *Television receivers.* (1) When testing of television receivers is required for a measure or measures of energy consumption described in § 430.22(h) of this subpart, a sample of sufficient size of each basic model shall be tested to ensure that, for each such measure of energy consumption, there is a 95 percent probability that the mean of the sample is within five percent of the true mean of such measures of the basic model, expect that no fewer than three units of each basic model shall be tested.

(2) The sample selected for paragraph (h)(1) of this section shall be a simple random sample drawn from the production stream of the basic model being tested.

* * * * *

4. Subpart B of Part 430 is amended to add an Appendix H, to read as follows:

Appendix H—Uniform Test Method for Measuring the Energy Consumption of Television Receivers

1. DEFINITIONS

1.1 "IRE-unit flat field" means a specific video electrical signal which results in a particular level of brightness of the television screen as established by the Institute of Radio Engineers.

1.2 "Filament keep-warm" means a feature that provides a voltage to keep vacuum tube and/or picture tube filaments warm for the purpose of allowing almost instantaneous response to the power control switch.

1.3 "Operating time" (t_o) means the hours per year during which the television receiver is operating with the power control switch turned on.

1.4 "Remote control" means an optional feature which allows the user to control the television receiver from more than one location by a hand held device.

1.5 "Standard operating mode" means operation of a television receiver with the filament keep-warm switch in its highest energy consuming position.

1.6 "Standby power consumption" (P_s) means the minimum amount of energy consumed with the power control switch turned off.

1.7 "Standby time" (t_s) means the hours per year during which the television receiver is connected to a power outlet with the power control switch turned off.

1.8 "Vacation operating mode" means operation of a television receiver with the vacation switch in its lowest energy consuming position during 50 percent of the standby time.

1.9 "Vacation switch" means an optional energy saving feature incorporated into the design of a television receiver that permits the user to disconect the filament keep-warm circuit(s).

2. TESTING CONDITIONS

2.1 Test equipment. The following equipment shall be used for testing of television receivers:

2.1.1 Regulated power source capable of supplying 120 volts alternating current ±1 percent.

2.1.2 Signal generator capable of producing radio frequency (RF) television test signals, at a convenient very high frequency (VHF) channel, modulated with National Television System Committee composite video as follows:

2.1.2.1 Standard White Pattern, RF signal modulated to 87 percent with a 100 IRE-unit flat field.

2.1.2.2 Standard Black Pattern, all adjustments as for 2.1.2.1 except modulated with a zero IRE-unit flat field.

2.1.2.3 The test signals in 2.1.2.1 and 2.1.2.2, supplied by a source whose impedance equals the design antenna impedance of the television receiver under test, adjusted to a level of 70 decibels (dB) ±2 dB, referred to a zero dB level of one femtowatt (1×10^{-15} watt) available powr. (For 70 dB from a 300-ohm source, one femtowatt corresponds to an open-circuit voltage of 3.5 millivolts. For the calculation of "available power" use American National Standard C16.13-1961, Method of Testing Monochrome Television Broadcast Receivers.)

2.1.3 Wattmeter capable of measuring the average power consumption of the television receiver under test with an error of not more than 1 percent.

2.2 *Initial Set-up of Television Receiver.*

2.2.1 Remove all batteries from television receivers designed for both battery and alternating current operation. Deactivate all preset or automatic controls affecting brightness which are customer options. Adjust all non-customer controls according to the manufacturer's service procedure.

2.2.2 Apply power to the television receiver under test from the power source specified in 2.1.1 through the wattmeter specified in 2.1.3. Adjust the volume control to the lowest possible setting.

2.2.3 Connect the output of the signal generator as specified in 2.1.2 to the VHF antenna terminals of the television receiver. Tune the television receiver to the channel of the RF signal.

2.3 *Measurement of Operating Power Consumption (P_o).*

2.3.1 Turn on the television receiver and allow at least five minutes warm-up time. With the synchronization controls adjusted for a stable test pattern, apply the standard white pattern of 2.1.2.1 to the television receiver. Adjust any customer controls other than the volume or synchronization controls for maximum power consumption as indicated by the wattmeter specified in 2.1.3. Illuminate any room illuminance sensor which has not been deactivated, to produce maximum power consumption. Record the white pattern power consumption (P_w) as indicated by the wattmeter in watts.

2.3.2 Change the signal source to the standard black pattern specified in 2.1.2.2. Adjust any customer controls, other than the volume or synchronisation controls, for the minimum power consumption as indicated by the wattmeter. Cover any room illuminance sensor which has not been deactivated. Record the black patten power consumption (P_B) as indicated by the wattmeter in watts.

2.3.3 Compute the operating power consumption (P_o) as follows:

$$P_o = \frac{P_w + P_B}{2}$$

where
P_s=operating power consumption in watts.
P_w=as determined from 2.3.1.
P_s=as determined from 2.3.2.

2.4 *Measurement of standby Power Consumption* (P_s).

2.4.1 Turn the television receiver power switch off and the vacation switch, if any, to the position of the lowest power consumption as indicated by the wattmeter. After at least two minutes, record the wattmeter reading in watts.

2.5 *Measurement of Additional Power Consumption from Use of Filament Keep-Warm (instant-on) Circuit(s)* (P_{kw}).

2.5.1 After the test of 2.4 for P_s, turn the vacation switch to the position of highest power consumption as indicated by the wattmeter. After at least two minutes, record the wattmeter reading in watts.

2.5.2 Compute P_{kw} by subtracting the value of P_s from the value found in 2.5.1.

2.6 *Measurement of Additional Power Consumption from the Use of Remote Control* (P_{rc}), *Whether or Not There is a Filament Keep-Warm (Instant-on Device).*

2.6.1 With the television receiver power switch off, turn any vacation switch to the position of lowest power consumption. Turn the television receiver power switch on. Turn the television receiver off using the remote control. After at least two minutes, record the wattmeter reading in watts.

2.6.2 Compute P_{rc} by subtracting the value of P_s from the value found in 2.6.1.

3. *Average Annual Energy Consumption Computation.*

3.1 *Base Annual Energy Consumption* (E_b) (kWh/yr).

$$E_b=\frac{P_o t_o}{1{,}000}+\frac{P_s t_s}{1{,}000}=2.2P_o+6.56P_s$$

where
E_b=base annual energy consumption, kWh/yr.
P_o=operating power consumption as computed in 2.3.3.
t_o=operating time, 2,200 hr/yr.
P_s=standby power consumption as computed in 2.4.1.
t_s=standby time, 6,560 hr/yr.

3.2 *Annual Filament Keep-warm (instant-on) Energy Consumption* (E_{kw})

$$E_{kw}=(P_{kw}/1{,}000)\times t_s=6.56P_{kw}$$

where
E_{kw}=Annual filament keep-warm energy consumption, kWh/yr.
P_{kw}/1,000=Keep-warm power consumption expressedia kilowatts.
t_s=standby time, 6,560 hr/yr.

3.3 *Annual Remote Control Energy Consumption* (E_{rc}).
E_{rc}=annual remote control energy consumption, kWh/yr.
P_{rc}/1,000=remote control power consumption, expressed in kilowatts.
t_s=standby time, 6,560 hr/yr.

3.4 *Total Average Annual Energy Consumption.*

3.4.1. For the standard operating mode:

$$E_s=E_b+E_{kw}+E_{rc}$$

where
E_s=total average annual energy consumed by the television receiver when operated in the standard operating mode (kWh/yr).

3.4.2. For the vacation operating mode:

$$E_s=E_b+.5E_{kw}+E_{rc}$$

where
E_s=total average annual energy consumed by the television receiver when operated in the vacation operating mode (kWh/yr).

[FR Doc.77-11983 Filed 4-21-77;5:00 pm]

[10 CFR Part 430]

ENERGY CONSERVATION PROGRAM FOR APPLIANCES

Proposed Rulemaking and Public Hearing Regarding Test Procedures for Refrigerators and Refrigerator-Freezers and Freezers

AGENCY: Federal Energy Administration.

ACTION: Proposed rule.

SUMMARY: The Federal Energy Administration (FEA) hereby proposes to amend Chapter II of Title 10, Code of Federal Regulations in order to prescribe test procedures for refrigerators and refrigerator-feezers and freezers pursuant to section 323, 42 U.S.C. 6293, of the Energy Policy and Conservation Act (Act) (Pub. L. 94-163). The Act requires that standard methods for testing refrigerators and refrigerator-freezers and freezers be prescribed as part of the energy conservation program for appliances. The intended effect of this proposal is to implement the Act's requirements for the solicitation of public comments before the test procedures are prescribed.

DATES: Comments by June 15, 1977 4:30 p.m.; requests to speak by May 31, 1977 4:30 p.m.; statements by June 13, 1977; hearing to be held on June 14, 1977, at 9:30 a.m.

ADDRESSES: Comments and requests to speak at the hearing to: Executive Communications, Room 3309, Federal Energy Administration, Box MA, Washington, D.C. 20461; statements to Regulations Management, Federal Energy Administration, Room 2214, 2000 M Street NW., Washington, D.C. 20461.

Hearing held at: Federal Energy Administration, Room 2105, 2000 M Street NW., Washington, D.C. 20461.

FOR FURTHER INFORMATION CONTACT:

James A. Smith, Room 307, Old Post Office Building, 12th Street and Pennsylvania Avenue NW., Washington, D.C. 20461, 202-566-4635.

SUPPLEMENTARY INFORMATION:

A. Background

Development of test procedures is one discrete part of the energy conservation program for appliances. Even when promulgated, final test procedures will not of themselves require testing to be conducted. They will merely establish standard methods for testing when testing is otherwise required by the Act itself or by regulations implementing other parts of the program. For example, the Federal Trade Commission (FTC), in exercising its appliance energy efficiency labelling authority regarding a particular appliance type, may well require the application of substantially less than all of the final test procedures applicable to that appliance type.

By notice issued May 10, 1976 (41 FR 19977, May 14, 1976), FEA proposed to establish Part 430, entitled "Energy Conservation Program for Appliances," in Chapter II of Title 10 of the Code of Federal Regulations. That notice proposed a Subpart A to Part 430, containing general provisions, and a Subpart C, containing proposed energy efficiency improvement targets. Proposed Subparts A and C have not yet been finalized. A further proposal of Subpart C will be necessary in order to meet the requirements of section 325(a)(1) of the Act as amended by section 161 of the Energy Conservation and Production Act (Pub. L. 94-385).

Subpart A as previously proposed (41 FR 19977, May 14, 1976, 42 FR 15422, March 22, 1977) contained definitions in proposed § 430.2, some of which are applicable to the test procedures for refrigerators and refrigerator-freezers and freezers. In addition, FEA is proposing to add to the definition in § 430.2 of "Basic model", a subparagraph (1) applying specifically to refrigerators and refrigerator-freezers, and a subparagraph (2) applying specifically to freezers.

By notice issued July 22, 1976 (41 FR 31237, July 27, 1976), FEA proposed an amendment to proposed Part 430 to add a Subpart B which would contain the appliance test procedures required to be prescribed by section 323 of the Act. The notice issued July 22 described the requirements of section 323 and set forth proposed test procedures for room air conditioners. A further notice issued March 24, 1977 (42 FR 16811, March 30, 1977) solicited comments with respect to a clarification of the provision concerning the number of units to be tested. By notice issued March 17, 1977 (42 FR 15423, March 22, 1977) FEA proposed an amendment setting forth proposed test procedures for dishwashers. Test procedures for several other products are in the process of being proposed at this time.

Section 323(a)(2) of the Act requires FEA to direct the National Bureau of Standards (NBS) to develop for 13 types of covered products test procedures for the determination of the estimated annual operating costs and at least one other useful measure of energy consumption which FEA determines is likely to assist consumers in making purchasing decisions. Pursuant to the Act, FEA directed NBS to develop test procedures for FEA's use in prescribing test procedures under the Act. As part of this undertaking, NBS was required to evaluate existing test procedures for measuring energy consumption of refrigerators and refrigerators-freezers and freezers.

NBS has transmitted to FEA test procedure review documents which reviewed existing test procedures for measuring energy consumption for refrigerators and refrigerator-freezers and freezers, and recommended test procedures. Copies of this review document will be made available for inspection by interested persons as provided for later in this notice. Under the Department of Commerce's (DOC) Voluntary Program for Appliance Efficiency, NBS proposed test procedures for refrigerators and refrigerator-freezers (40 FR 26298, June 23, 1975) and freezers (40 FR 26287, June 23, 1975) prior to the enactment of the Act. These test procedures were based on the Association of Home Appliance Manufacturers' (AHAM) Standard HRF-2-ECFT-1975 and the American National Standard (ANS) B38.1-1970. Test procedures were not finalized under the DOC's voluntary program due to passage of the Act.

The test procedures recommended by NBS and proposed today incorporate the procedures for measuring average energy consumption per cycle type as described in AHAM Standard HRF-2-ECFT-1975 and the procedures for determining the net refrigerated volume as described in ANS B38.1-1970 and, in addition, pro-

vide procedures for determining the estimated annual operating costs and energy efficiency of refrigerators and refrigerator-freezers and freezers. For the purposes of this proposal the AHAM Standard HRF-2-ECFT-1975 is modified by Appendix B of the proposal to change the freezer multiplication factor in 4.4.2 of the AHAM Standard from 0.9 to 0.7 for chest freezers and 0.85 for upright freezers.

B. MEASURES OF ENERGY CONSUMPTION

The Act requires FEA to prescribe test procedures for the determination of estimated annual operating costs and at least one other measure of energy consumption which the Administrator determines is likely to assist consumers in making purchasing decisions. The estimated annual operating cost is the product of the representative average-use cycle times the cost of energy used per cycle for the normal cycle. The cost of energy used per normal cycle is, in turn, dependent upon the representative average unit energy costs as provided by the Administrator and the energy consumed in the normal cycle. The "normal cycle" is proposed as the cycle type upon which the estimated annual operating cost is based. The normal cycle for a refrigerator and refrigerator-freezer and freezer without an anti-sweat heater switch (described below) would be defined as the operation of the refrigerator and refrigerator-freezer and freezer as required by the proposed test procedures (§§ 430.22(a)(1), 430.22(b)(1)). The normal cycle for a refrigerator and refrigerator-freezer and freezer with an anti-sweat heater switch would be defined as the operation of the product as required by the proposed test procedures (§§ 430.22(a)(1), 430.22(b)(1)) with the anti-sweat heater switch in the highest energy consuming position.

Also proposed as test procedures (§§ 430.22(a)(2), 430.22(b)(2)) for the determination of other measures of energy consumption which are likely to assist consumers in making purchasing decisions are test procedures regarding the estimated annual operating cost for any specified cycle type other than the normal cycle. As with test procedures for the estimated annual operating cost, these test procedures could be used to provide consumers with useful cost information regarding refrigerator and refrigerator-freezer and freezer operation with the anti-sweat heater switch either in the lowest energy consuming position for a cycle (24 hours) or with the anti-sweat heater switch set in the lowest energy position for a pre-determined percentage of the cycle. For example, if the estimated annual operating cost of the refrigerator and refrigerator-freezer or freezer with a cycle type in which the anti-sweat heater switch is set in the lowest energy consuming position were presented to the consumer along with information regarding the normal cycle, potential purchasers would have more complete information by which to compare the operating costs of units which use anti-sweat heaters, units which use anti-sweat heaters in conjunction with a switch, and units which use sweat control methods other than a heater.

It is proposed that the estimated annual operating cost for any other specified cycle type be determined similarly to the determination of such cost for the normal cycle, except that any required tests would be run on the specified cycle and not on the normal cycle. The application of these test measures, however, is not required until an appropriate authority, such as FTC in exercising its authority pursuant to the appliance labeling provisions of the program, has specified the cycle type(s) for which estimated annual operating costs are required to be measured.

An additional proposed measure (§§ 430.22(a)(3), 430.22(b)(3)) that is likely to assist consumers in making purchasing decisions is the energy factor. If the appliance does not have an anti-sweat switch, the energy factor would be defined as the quotient of the adjusted total refrigerated volume (as defined in 1.1. of Appendix A to Subpart B), in cubic feet, of refrigerators and refrigerator-freezers and the net refrigerated volume, in cubic feet, of freezers, divided by the energy consumption for the normal cycle in kilowatt-hours per cycle. For refrigerators and refrigerator-freezers and freezers with an anti-sweat heater switch, the energy factor would be defined as the quotient of the adjusted total volume, in cubic feet, for refrigerators and refrigerator-freezers and the net refrigerated volume, in cubic feet, for freezers, divided by one half the sum of (1) the total per-cycle kilowatt-hour energy consumption with the anti-sweat heater switch set in the lowest energy consuming position. Among other possible applications, the energy factor may be used by FEA to determine the efficiency of refrigerators and refrigerator-freezers and freezers for the purposes of the efficiency improvement program described by section 325 of the Act.

Some refrigerator and refrigerator-freezer and freezer manufacturers use an "anti-sweat heater" (defined in 1.2 of Appendix A to Subpart B) to keep condensation from forming on the exterior surfaces of the cabinet under adverse (high humidity) ambient conditions. The anti-sweat heater, while keeping condensation from forming on the exterior surfaces of the cabinet, also adds to the heat load that must be removed by the refrigerator and refrigerator-freezer or freezer in order to lower cabinet temperatures for food preservation. By controlling the operation of the anti-sweat heater with a switch such that the heater is operating at a level required by the ambient conditions and not at full capacity when not required, the energy consumed by the refrigerater and refrigerator-freezer or freezer is generally reduced. Accordingly, the energy consumption setting of an anti-sweat heater switch affects the energy consumption of the refrigerator and refrigerator-freezer and freezer and, as such, would be defined as a cycle type.

The procedure proposed in §§ 430.22(a)(3) and 430.22(b)(3) for measuring the contribution of an anti-sweat heater switch that reduces the energy consumption requirements of the anti-sweat heater assumes that the switch is in the lowest energy consuming position 50 percent of the time. A 50 percent frequency of use basis was established under the DOC's Voluntary Appliance Efficiency Program for any feature that required consumer interaction and for which actual usage was unknown. Further, in public hearings held by FEA on the initial proposed energy efficiency targets, several appliance manufacturers recommended that a 50 percent figure for consumer usage be utilized when actual usage is unknown. One manufacturer, however, submitted survey data that indicated that approximately 80 percent of the respondents to its survey reported the "usual" position was "dry" (the lowest energy consuming position) and recommended that an 80 percent credit be given for the use of an anti-sweat heater switch.

FEA is proposing a 50 percent frequency of use factor for usage of the anti-sweat heater switch for computing the energy factor because it believes that to be a reasonable estimate of actual consumer usage. FEA will modify the contribution of energy saving features, such as the anti-sweat heater switch, if usage information is developed that indicates that other frequency of use patterns exist.

Refrigerators and refrigerator-freezers have two different temperature zones—a fresh food storage compartment that operates, on the average, at about 38° F and a frozen food storage compartment that operates, on the average, at approximately 5° F for a refrigerator-freezer and 15° F for a refrigerator. The refrigerator and refrigerator-freezer with a large percentage of its net refrigerator volume devoted to the freezer compartment must cool a larger volume to a lower temperature than a similar model with a smaller freezer compartment. Hence, while the model with the larger freezer volume tends to consume more energy than the model with the smaller freezer volume, it is performing a larger measure of work, i.e., cooling a larger volume.

In order to evaluate two basic model groups with identical net refrigerated volumes but different net freezer refrigerated volumes, a correction factor is applied to the net freezer refrigerated volume. This correction factor is the ratio of heat flow through a freezer compartment wall to the surrounding environment to the heat flow through an equivalent fresh food compartment wall. This ratio is approximated by the ratio of the temperature difference between the ambient air (90° F) and the refrigerated compartment temperatures of 5° F for the refrigerator-freezers' freezer compartment or 15° F for the refrigerators' freezer compartment, and 38° F for the fresh food compartments. Accordingly, a correction factor of 1.44 ((90° F–15° F)/(90° F–38° F)=1.44) for refrigerators, and 1.63 ((90° F–5° F)/(90° F–

38° F) = 1.63) for refrigerator-freezers is assigned.

The correction factor means that it takes approximately 1.63 times more energy to maintain a given insulated space at 5° F than at 38° F in a 90° F ambient. Accordingly, in determining the energy factor of refrigerators and refrigerator-freezers, the product of the net freezer refrigerated volume in cubic feet multiplied by the appropriate correction factor is added to the net general refrigerated volume in cubic feet to determine the adjusted total refrigerated volume. As previously described, the quotient of the adjusted total refrigerated volume in cubic feet divided by the per-cycle energy consumption in kilowatt-hours per-cycle is the energy factor.

FEA recognizes that there may be additional useful measures of energy consumption for refrigerators and refrigerators-freezers and freezers other than the measures described above. Accordingly §§ 430.22 (a) (4) and (b) (4) provide for other useful measures which the Administrator determines are likely to assist consumers in making purchasing decisions. These measures, however, must be derived from the application of the uniform test methods proposed today as Appendices A and B to Subpart B. Refrigerator and refrigerator-freezer and freezer manufacturers would, if required, only have to perform various computations while still applying the same test methods contained in Appendices A and B. For example, if the Administrator determined that a per-cycle cost for a specified cycle type would aid consumers in making purchasing decisions, this cost could be derived by applying the uniform test method for that cycle type and dividing by the annual usage to arrive at a per-cycle figure.

C. Laboratory Methodology

Proposed Appendices A and B to Subpart B provide for a controlled laboratory environment for measuring energy consumption for the various refrigerators and refrigerator-freezers and freezers (and their various cycle types) which are available to the consumer. The proposed test methods in Appendices A and B measure energy consumption in kilowatt-hours per cycle for the refrigerator and refrigerator-freezer and freezer under test. From these standard measures of energy consumption, using the proposed refrigerator and refrigerator-freezer test procedures (§ 430.22(a)) and freezer test procedures (§ 430.22(b)) (which include the values of the representative average-use cycle and the representative average unit costs of energy), various determinations of refrigerator and refrigerator-freezer and freezer energy costs and energy consumption can be derived in a standard fashion.

The test method contained in AHAM Standard HRF-2-ECFT-1975 simulates home usage of refrigerators, refrigerator-freezers and freezers in a standardized manner to provide accurate and repeatable data that correlate with home usage data. The use of a 32.2° C (90° F) ambient temperature, closed door test method, modified by the application of a correction factor when appropriate, compensates for the door openings, different ambient temperatures and food loads which are imposed upon the units in actual home use.

A correction factor is applied to the energy consumption values of the laboratory tests when the laboratory test values do not match field survey energy consumption values. For example, home freezers are often located on porches or in basements where the ambient temperatures are on the average much lower than the 90° F ambient temperature specified in the proposed test procedure.

Correlations of the laboratory test results using the proposed test methods with field survey data have been performed by NBS, in conjunction with the industry, on 246 refrigerator-freezers. These data show the average energy consumption in actual home use to be 1.02 times that measured in the laboratory tests using the proposed test method. For refrigerators, based on a sample of 9, the average home use energy consumption is 92 percent of the energy consumption measure by the proposed test method. These values are approximately equal to the laboratory test results. Copies of the results of this survey will be made available for inspection by interested persons as provided for later in this notice. Until further data are collected and indicate that the values are not representative, correction factors are not proposed for the laboratory test energy consumption values for refrigerators and refrigerator-freezers.

The actual home use energy consumption data obtained from 176 upright freezers indicate that home upright freezer energy consumption is 85 percent of that determined in laboratory tests using the proposed test method. Accordingly, it is proposed that the upright freezer laboratory test results determined according to the proposed test method be multiplied by a correction factor of .85 (4.1.2 of Appendix B to Subpart B). The actual home use energy consumption data obtained from 62 chest freezers indicate that the average chest home freezer energy consumption is 71 percent of the energy consumption value determined in the laboratory with the proposed test method. Accordingly, it is proposed that the chest freezer laboratory test results determined according to the proposed test method be multiplied by a correction factor of 0.7 (4.1.1 of Appendix B to Subpart B). Copies of the results of these surveys will be made available for inspection by interested persons as provided for later in this notice.

D. Representative Average-Use Cycle

Section 323(b) (2) (42 U.S.C. 6293(b) (2)) of the Act provides that test procedures for determining estimated annual operating costs of any covered product shall be calculated from measurements of energy use in a representative average-use cycle (as determined by the Administrator) and from representative average unit costs (as provided by the Administrator) needed to operate such product during such cycle. FEA has determined that the representative average-use cycle for refrigerators and refrigerator-freezers and freezers is 365 cycles per year. This determination is based NBS' recommendation to FEA which, in turn, is based upon the steady state, continuous operation of the unit. NBS' recommendation is available for inspection as provided for later in this notice.

FEA intends to develop representative average unit costs of energy needed to calculate the annual operating cost for the representative average-use cycle and to provide this information to manufacturers and FTC on or before the effective date of test procedures for refrigerators and refrigerator-freezers and freezers.

E. Number of Units to be Tested

Proposed § 430.23 (a) and (b) would provide for sampling of each basic model to be tested when testing of refrigerators and refrigerator-freezers and freezers is required by the Act or by program regulations of agencies responsible for administering the Act. This provision is intended both to provide an acceptable level of assurance that test results are applicable to any entire basic model for which testing is required and to minimize the testing burden on manufacturers. FEA believes that the sampling approach proposed today will enable consumers to make meaningful comparisons of information appearing on appliance labels, and also will meet the requirements of section 323(b) of the Act that test procedures not be unduly burdensome to conduct.

Under proposed § 430.23(a) and (b), a sample of sufficient size of each basic model would be tested to assure that, for each measure of energy consumption described in §§ 430.22(a) and 430.22(b), there is a 95 percent probability that the mean of the values of these measures of the sample is within 20 percent of the true mean of these measures of the basic model. The size of the sample of a particular basic model will depend upon the following factors:

(a) The level of confidence required (set at 95 percent in the proposed regulations);

(b) The maximum allowable difference between the sample mean and the mean of the basic model (expressed in the proposal as a percent of the true mean and set at 20 percent); and

(c) The relationship of the mean and standard deviation of the basic model.

The relationship of the mean and standard deviation of the basic model can be determined from data available to manufacturers. With this information and using standard statistical techniques, manufacturers can determine the number of units required to be tested. In any case, no fewer than three units of each basic model must be tested. Sample units would be selected randomly from the production stream.

Manufacturers and other interested persons are encouraged to comment on the sampling approach. Manufacturers are especially encouraged to submit any data which relates to the size of the sam-

ples which the provision would require to be tested. Comments alleging that the sampling provision is burdensome should include a full discussion of the facts upon which such allegation is based.

F. REQUEST FOR PARTICULAR COMMENTS

While FEA is soliciting comments on all aspects of the proposed test procedures for refrigerators and refrigerator-freezers and freezers, FEA is particularly interested in receiving comments on any other useful measures of energy consumption or data on typical usage of refrigerator and refrigerator-freezer or freezers in addition to those proposed today. In addition, FEA is interested in receiving comments with respect to the calculation of the energy factor and the consumer usage of the anti-sweat heater switch. Also, FEA is interested in receiving comments on any definitions described in previously proposed section 430.2, as these provisions might affect the testing of refrigerators and refrigerator-freezers and freezers. Comments with respect to refrigerators and refrigerator-freezers and freezers regarding provisions in previously proposed section 430.2 are timely until the close of the written record, as specified below. For the convenience of the reviewer, the proposed definitions of "refrigerator," "refrigerator-freezer," and "freezer" (41 FR 19979, May 14, 1976) are as follows:

Section 430.2 *Definitions.*

* * * * *

"Refrigerator" means a cabinet designed for the refrigerated storage of food at temperatures above 32° F, and having a source of refrigeration requiring an energy input. It may include a compartment for the freezing and storage of food at temperatures below 32° F but does not provide a separate low temperature compartment designed for the freezing of and the long term storage of food at temperatures below 8° F. It has only one exterior door, but it may have interior doors on compartments.

"Refrigerator-freezer" means a cabinet which consists of two or more compartments with at least one of the compartments designed for the refrigerated storage of foods at temperatures above 32° F. and with at least one of the compartments designed for the freezing of and the storage of frozen foods at temperatures of 8° F or below and may be capable of being adjusted by the user to a temperature of 0° F or below. The source of refrigeration requires energy input.

"Freezer" means a cabinet designed as a unit for the storage of food at temperatures of 0° F, having the ability to freeze food, and having a source of refrigeration requiring an energy input.

* * * * *

G. COMMENT PROCEDURE

1. WRITTEN COMMENT

Interested persons are invited to participate in this rulemaking by submitting data, views or arguments with respect to the proposed test procedures for refrigerators and refrigerator-freezers and freezers set forth in this notice to Executive Communications, Room 3309, Federal Energy Administration, Box MA, Washington, D.C. 20461.

Comments should be identified on the outside of the envelop and on documents submitted to FEA with the designation "Refrigerators and Refrigerator-Freezers and Freezers-Proposed Test Procedures." Fifteen copies should be submitted. All comments received by June 15, 1977, before 4:30 p.m., e.s.t., and all other relevant information, will be considered by FEA before final action is taken on the proposed regulations.

Any information or data considered by the person furnishing it to be confidential must be so identified and submitted in writing, one copy only. FEA reserves the right to determine the confidential status of the information or data and treat it according to its determination.

2. PUBLIC HEARINGS

a. *Request procedure.* The time and place of the public hearing are indicated at the beginning of this preamble.

FEA invites any person, who has an interest in the proposed rulemaking issued today, or who is a representative of a group or class of persons that has an interest in today's proposed rulemaking, to make a written request for an opportunity to make an oral presentation. Such a request should be directed to the address indicated at the beginning of this preamble and must be received before 4:30 p.m., e.s.t., on May 31, 1977. Such a request may be hand delivered to such address, between the hours of 8 a.m. and 4:30 p.m., Monday through Friday. A request should be labeled both on the document and on the envelope "Refrigerators and Refrigerator-Freezers and Freezers—Proposed Test Procedures."

The person making the request should briefly describe the interest concerned; if appropriate, state why she or he is a proper representative of a group or class of persons that has such an interest; and give a concise summary of the proposed oral presentation and a telephone number where she or he may be contacted through June 13, 1977.

FEA will notify, before 4:30 p.m., June 2, 1977, each person selected to appear at a hearing. Each person selected to be heard must submit 50 copies of her or his statement to the address and by the date given in the beginning of this preamble. In the event any person wishing to testify cannot meet the 50 copy requirement, alternative arangements can be made with the Office of Regulations Management in advance of the hearing by so indicating in the letter requesting an oral presentation or by calling the Office of Regulations Management at 202–254–3345.

b. *Conduct of Hearings.* FEA reserves the right to select the persons to be heard at this hearing, to schedule their respective presentations and to establish the procedures governing the conduct of the hearing. The length of each presentation may be limited, based on the number of persons requesting to be heard.

An FEA official will be designated to preside at the hearing. This will not be a judicial or evidentiary-type hearing. Questions may be asked only by those conducting the hearing, and there will be no cross-examination of persons presenting statements. Any decision made by FEA with respect to the subject matter of the hearing will be based on all information available to FEA. At the conclusion of all initial oral statements, each person who has made an oral statement will be given the opportunity if she or he so desires, to make a rebuttal statement. The rebuttal statements will be given in the order in which the initial statements were made and will be subject to time limitations.

Any interested person may submit questions to be asked of any person making a statement at the hearing to Executive Communications, FEA, before 4:30 p.m., e.s.t., June 9, 1977. FEA will determine whether the question is relevant, and whether the time limitations permit it to be presented for answer.

Any person who makes an oral statement and who wishes to ask a question at the hearing may submit the question, in writing, to the presiding officer. The presiding officer, will determine whether the question is relevant, and whether the time limitations permit it to be presented for answer.

Any further procedural rules needed for the proper conduct of the hearing will be announced by the presiding officer.

A transcript of the hearing will be made and the entire record of the hearing, including the transcript, will be retained by FEA and made available for inspection at the FEA Freedom of Information Office, Room 2107, Federal Building, 12th and Pennsylvania Avenue NW., Washington, D.C., between the hours of 8 a.m. and 4:30 p.m., Monday through Friday. Any person may purchase a copy of the transcript from the reporter. A copy of NBS's recommendations concerning test procedures for refrigerators and refrigerator-freezers and freezers along with related NBS/industry home energy usage survey results will also be made available for inspection at at FEA Freedom of Information Office.

H. ENVIRONMENTAL AND INFLATIONARY REVIEW

As required by section 7(c)(2) of the Federal Energy Administration Act of 1974 (Pub. L. 93–275), a copy of this notice has been submitted to the Administrator of the Environmental Protection Agency for his comments concerning the impact of this proposal on the quality of the environment. The Administrator has no comments.

The National Environmental Policy Act of 1969 requires FEA to assess the environmental impacts of any proposal by the Agency for "major Federal actions significantly affecting the quality of the human environment." Since test procedures under the conservation program for appliances will be used only to standardize the measurement of energy usage and will not affect the quantity or distribution of energy usage, FEA has determined that the action of prescribing test procedures, by itself, will not result in any environmental impacts. On this basis, FEA has determined that, with

respect to prescribing test procedures under the conservation program for appliances, no environmental impact statement is required.

The proposal has been reviewed in accordance with Executive Order 11821 as amended by Executive Order 11949, and OMB Circular No. A-107 and has been determined not to be a major proposal requiring evaluation of its economic impact as provided for therein.

(Energy Policy and Conservation Act, Pub. L. 94-163, as amended by Pub. L. 94-385; Federal Energy Administration Act of 1974, Pub. L. 93-275, as amended by Pub. L. 94-385; E.O. 11790, 39 FR 23185.)

In consideration of the foregoing, it is proposed to amend Chapter II of Title 10, Code of Federal Regulations, as set forth below.

Issued in Washington, D.C., April 21, 1977.

ERIC J. FYGI,
Acting General Counsel,
Federal Energy Administration.

1. Section 430.2 is amended by adding paragraphs (1) and (2) as part of the definition of the term "Basic model", to read as follows:

§ 430.2 Definitions.

* * * * *

"Basic model" means all units of a given type of covered product manufactured by one manufacturer and—

(1) With respect to refrigerators and refrigerator-freezers, having essentially identical functional, physical and electrical characteristics.

(2) With respect to frezers, having essentially identical functional, physical and electrical characteristics.

* * * * *

2. Section 430.22 is amended by adding paragraphs (a) and (b), to read as follows:

§ 430.22 Test procedures for measures of energy consumption.

(a) *Refrigerators and refrigerator-freezers.* (1) The estimated annual operating cost for refrigerators and refrigerator-freezers shall be the product of the following three factors: (i) The representative average-use cycle of 365 cycles per year, (ii) the average per-cycle energy consumption for the normal cycle in kilowatt-hours per cycle, determined according to 4.1 of Appendix A of this subpart, and (iii) the representative average unit cost in dollars per killowatt-hour as provided by the Administrator, the resulting product then being rounded off to the nearest dollar per year.

(2) The estimated annual operating cost for any other specified cycle type for refrigerators and refrigerator-freezers shall be the product of the following three factors: (i) The representative average-use cycle of 365 cycles per year, (ii) the per-cycle energy consumption for the specified cycle type, determined according to 4.1 of Appendix A to this subpart, and (iii) the representative average unit cost in dollars per kilowatt-hour as provided by the Administrator, the resulting product then being rounded off to the nearest dollar per year.

(3) The energy factor for refrigerators and refrigerator-freezers, expressed in cubic feet per kilowatt-hour per cycle, shall be—

(i) For refrigerators and refrigerator-freezers not having an anti-sweat heater switch, the quotient of (A) the adjusted total volume in cubic feet, determined according to 4.2 of Appendix A of this subpart, divided by (B) the total per-cycle energy consumption for the normal cycle in kilowatt-hours per cycle, determined according to 4.1 of Appendix A of this subpart, and

(ii) For refrigerators and refrigerator-freezers having an anti-sweat heater switch, the quotient of (A) the adjusted total volume in cubic feet, determined according to 4.2 of Appendix A of this subpart, divided by (B) one half the sum of the total per-cycle energy consumption for the normal cycle and the total per-cycle energy consumption for the cycle when the anti-sweat heater switch is set in the lowest energy consuming position, each in kilowatt-hours per cycle, determined according to 4.1 of Appendix A of this subpart.

(4) Other useful measures of energy consumption for refrigerators and refrigerator-freezers shall be those measures of energy consumption for refrigerators and refrigerator-freezers which the Administrator determines are likely to assist consumers in making purchasing decisions and which are derived from the application of Appendix A of this subpart.

(b) *Freezers.* (1) The estimated annual operating cost for freezers shall be the product of the following three factors: (i) The representative average-use cycle of 365 cycles per year, (ii) the average per-cycle energy consumption for the normal cycle in kilowatt-hours per cycle, determined according to 4.1 of Appendix B of this subpart, and (iii) the representative average unit cost in dollars per kilowatt-hour as provided by the Administrator, the resulting product then being rounded off to the nearest dollar per year.

(2) The estimated annual operating cost for any other specified cycle type for freezers shall be the product of the following three factors: (i) The representative average-use cycle of 365 cycles per year, (ii) the per-cycle energy consumption for the specified cycle type, determined according to 4.1 of Appendix B to this subpart, and (iii) the representative average unit cost in dollars per kilowatt-hour as provided by the Administrator, the resulting product then being rounded off to the nearest dollar per year.

(3) The energy factor for freezers, expressed in cubic feet per kilowatt-hours per cycle, shall be—

(i) For freezers not having an anti-sweat heater switch the quotient of (A) the net freezer refrigerated volume in cubic feet, determined according to 3.2 of Appendix B of this subpart, divided by (B) the total per-cycle energy consumption for the normal cycle in kilowatt-hour per cycle, determined according to 4.1 Appendix B of this subpart, and

(ii) For freezers having an anti-sweat heater switch, the quotient of (A) the net freezer refrigerated volume in cubic feet, determined according to 3.2 of Appendix B of this subpart, divided by (B) one half the sum of the total per-cycle energy consumption for the normal cycle and total per-cycle energy consumption for the cycle when the anti-sweat switch is set in the lowest energy consuming position, each in kilowatt-hours per cycle, determined according to 4.1 of Appendix B of this subpart.

(4) Other useful measures of energy consumption for freezers shall be those measures of energy consumption for freezers which the Administrator determines are likely to assist consumers in making purchasing decisions and which are derived from the application of Appendix B of this subpart.

3. Section 430.23 is amended by adding paragraphs (a) and (b), to read as follows:

§ 430.23 Units to be tested.

(a) *Refrigerators and refrigerator-freezers.* (1) When testing of refrigerators and refrigerator-freezers is required for a measure or measures of energy consumption described in § 430.22(a) of this subpart, a sample of sufficient size of each basic model shall be tested to ensure that, for each such measure of energy consumption, there is a 95 percent probability that the mean of the sample is within 20 percent of the true mean of such measures of the basic model, except that no fewer than three units of each basic model shall be tested.

(2) The sample selected for paragraph (a)(1) of this section shall be a simple random sample drawn from the production stream of the basic model being tested.

(3) A basic model having dual voltage ratings shall be separately tested at each design voltage such that the requirements of paragraph (a)(1) of this section are satisfied at each rating.

(b) *Freezers.* (1) When testing of freezers is required for a measure or measures of energy consumption described in § 430.22(b), a sample of sufficient size of each basic model shall be tested to ensure that, for each such measure of energy consumption, there is a 95 percent probability that the mean of the sample is within 20 percent of the true mean of such measures of the basic model, except that no fewer than three units of each basic model shall be tested.

(2) The sample selected for paragraph (b)(1) of this section shall be a simple random sample drawn from the production stream of the basic model being tested.

(3) A basic model having dual voltage ratings shall be separately tested at each design voltage such that the requirements of paragraph (b)(1) of this section are satisfied at each rating.

4. Subpart B of Part 430 is amended to add an Appendix A, to read as follows:

APPENDIX A—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF REFRIGERATORS AND REFRIGERATOR-FREEZERS

1. DEFINITIONS

1.1 "Adjusted total refrigerated volume" means the sum of the net general refrigerated volume in cubic feet and the product of a correction factor times the net freezer refrigerated volume in cubic feet.

1.2 "Anti-sweat heater" means a device incorporated into the design of a refrigerator or refrigerator-freezer to prevent the accumulation of moisture on exterior surfaces of the cabinet under conditions of high ambient humidity.

1.3 "Cycle" means the operation of a refrigerator or refrigerator-freezer with the consumer activated controls preset such that the design refrigeration requirements of the refrigerator and refrigerator-freezer are performed.

1.4 "Cycle type" means the operation of a refrigerator or refrigerator-freezer by presetting the consumer activated controls to establish various operating characteristics.

1.5 "Normal cycle" means the cycle type in which the anti-sweat heater switch, when provided, is set in the highest energy consuming position.

2. TESTING CONDITIONS

2.1 *Operational conditions.* Install the refrigerator and refrigerator-freezer and maintain the operating conditions in accordance with the Association of Home Appliance Manufacturers (AHAM) Standard HRF-2-ECFT-1975. All references in HRF-2-ECFT-1975 to American National Standard (ANS) B38.1 shall be interpreted as references to ANS B38.1-1970.

3. TEST CYCLE AND MEASUREMENTS

3.1 *Test cycle.* Perform a test cycle type by establishing the testing conditions set forth in 2, testing the refrigerator and refrigerator-freezer in accordance with the AHAM Standard HRF-2-ECFT-1975.

3.2 *Test measurements.* Measure refrigerator and refrigerator-freezer net refrigerated volume, V_r, expressed in cubic feet and defined, in accordance with ANS B38.1-1970, section 3.2 as:

$$V_r = V_f + V_g$$

where,
V_f = net freezer refrigerated volume.
V_g = net general refrigerated volume.

3.3 *Reported values.* State the reported values of energy consumption as determined in accordance with AHAM Standard HRF-2-ECFT-1975, and the net freezer refrigerated volume, net general refrigerated volume, and the net refrigerated volume as determined in accordance with ANS B38.1-1970, Section 3.2.

4. CALCULATION OF DERIVED RESULTS FROM TEST MEASUREMENTS

4.1 *Per-cycle average energy consumption.* Calculate for the cycle type under test the per-cycle average energy consumption of refrigerators and refrigerator-freezers in accordance with AHAM Standard HRF-2-ECFT-1975.

4.2 ADJUSTED TOTAL VOLUME

4.2.1 *Refrigerators.* Calculate for refrigerators under test the adjusted total refrigerated volume, V_r, expressed in cubic feet and defined as:

$$V_r = (V_f \times C_r) + V_g$$

where
V_f and V_g are defined in 3.2, and
C_r = correction factor of 1.44.

4.2.2 *Refrigerator-freezers.* Calculate for refrigerator-freezers under test the adjusted total refrigerated volume, V_{rf}, expressed in cubic feet and defined as:

$$V_{rf} = (V_f \times C_{rf}) + V_g$$

where
V_f and V_g are defined in 3.2, and
C_{rf} = correction factor of 1.63.

5. Subpart B of Part 430 is amended to add an Appendix B, to read as follows:

APPENDIX B—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF FREEZERS

1. DEFINITIONS

1.1 "Anti-sweat heater" means a device incorporated into the design of a freezer to prevent the accumulation of moisture on exterior surfaces of the cabinet under conditions of high ambient humidity.

1.2 "Cycle" means the operation of a freezer with the consumer activated controls preset such that the design refrigeration requirements of the freezer are performed.

1.3 "Cycle type" means the operation of a freezer, presetting the consumer activated controls to establish various operating characteristics.

1.4 "Normal cycle" means the cycle type in which the anti-sweat heater switch, when provided, is set in the highest energy consuming position.

2. TESTING CONDITIONS

2.1 *Operational conditions.* Install the freezer and maintain the operating conditions in accordance with the Association of Home Appliance Manufacturers (AHAM) Standard HRF-2-ECFT-1975. All references in HRF-2-ECFT-1975 to American National Standard (ANS) B38.1 shall be interpreted as references to ANS B38.1-1970.

3. TEST CYCLE AND MEASUREMENTS

3.1 *Test cycle.* Perform a test cycle type by establishing the testing conditions set forth in 2, testing the freezer in accordance with the AHAM Standard HRF-2-ECFT-1975.

3.2 *Test measurements.* Measure the net freezer refrigerated volume in accordance with the ANS B38.1-1970, Section 4.2.

3.3 *Reported values.* State the reported values of energy consumption, E_t, as determined in accordance with AHAM Standard HRF-2-ECFT-1975 and the net freezer refrigerated volume as determined in accordance with ANS B38.1-1970, Section 4.2.

4. CALCULATION OF DERIVED RESULTS FROM TEST MEASUREMENTS

4.1 *Per-cycle average energy consumption.*

4.1.1 *Chest freezers.* Calculate for chest freezers under test the per-cycle average energy consumption, E_c, expressed in kilowatt-hours (kWh) and defined as:

$$E_c = E_t \times C_c$$

where
E_t *is defined in 3.3, and*
C_c = correction factor of .7.

4.1.2 *Upright freezers.* Calculate for upright freezers under test the per-cycle average energy consumption, E_u, expressed in kWh and defined as:

$$E_u = E_t \times C_u$$

where
E_t is defined in 3.3, and
C_u = correction factor of .85.

[FR Doc.77-11984 Filed 4-21-77;5:00 pm]

[10 CFR Part 430]

ENERGY CONSERVATION PROGRAM FOR APPLIANCES

Proposed Rulemaking and Public Hearing Regarding Test Procedures for Clothes Dryers

AGENCY: Federal Energy Administration.

ACTION: Proposed rule.

SUMMARY: The Federal Energy Administration (FEA) proposes to amend Chapter II of Title 10, Code of Federal Regulations, in order to prescribe test procedures for clothes dryers, pursuant to section 323, 42 U.S.C. 6293, of the Energy Policy and Conservation Act (Act) (Pub. L. 94-163). The Act requires that standard methods for testing clothes dryers be prescribed as part of the energy conservation program for appliances. The intended effect of this proposal is to implement the Act's requirements for the solicitation of public comments before the test procedures are prescribed.

DATES: Comments by June 15, 1977, 4:30 p.m.; requests to speak by May 31, 1977, 4:30 p.m.; statements by June 10, 1977, 4:30 p.m.; hearing to be held on June 13, 1977 at 9:30 a.m.

ADDRESS: Comments and requests to speak at the hearing to: Executive Communications, Room 3309, Federal Energy Administration, Box LX, Washington, D.C. 20461; statements to Regulations Management, Federal Energy Administration, Room 2214, 2000 M Street NW., Washington, D.C. 20461.

Hearing held at: Federal Energy Administration, 2000 M Street NW., Room 2105, Washington, D.C. 20461.

FOR FURTHER INFORMATION CONTACT:

James A. Smith, Room 307, Old Post Office Building, 12th Street and Pennsylvania Avenue NW., Washington, D.C. 20461, 202-566-4635.

SUPPLEMENTARY INFORMATION:

A. BACKGROUND

Development of test procedures is one discrete part of the energy conservation program for appliances. Even when promulgated, final test procedures will not of themselves require testing to be conducted. They will merely establish standard methods for testing when testing is otherwise required by the Act itself or by regulations implementing other parts of the program. For example, the Federal Trade Commission (FTC), in exercising its applicance energy efficiency labelling authority regarding a particular appliance type, may well require the application of substantially less than all of the final test procedures applicable to that appliance.

By notice issued May 10, 1976 (41 FR 19977, May 14, 1976), FEA proposed to establish Part 430, entitled "Energy Conservation Program for Appliances," in Chapter II of Title 10 of the Code of Federal Regulations. That notice proposed a Subpart A to Part 430, containing general provisions, and a Subpart C, containing proposed energy efficiency improvement targets. Proposed Subparts A and C have not yet been finalized. A further proposal of Subpart C will be necessary in order to meet the requirements of section 325(a)(1) of the Act as amended by section 161 of the Energy Conservation and Production Act (Pub. L. 94-385).

Subpart A as previously proposed (41 FR 19977, May 14, 1976; 41 FR 1542, March 27, 1977), contained definitions in proposed § 430.2, some of which are applicable to the test procedures for clothes dryers. In addition, FEA is proposing to add to the definition in § 430.2 of "Basic model", a subparagraph (4) applying specifically to clothes dryers.

By notice issued July 22, 1976 (41 FR 31237, July 27, 1976), FEA proposed an amendment to proposed Part 430 to add a Subpart B which would contain the appliance test procedures required to be prescribed by section 323 of the Act. The notice issued July 22 described the requirements of section 323 and set forth proposed test procedures for room air conditioners. A further notice issued March 24, 1977 (42 FR 16811, March 30, 1977) solicited comments with respect to a clarification of the provision concerning the number of units to be tested. By notice issued March 17, 1977 (42 FR 15423, March 22, 1977) FEA proposed an amendment setting forth proposed test procedures for dishwashers. Test procedures for several other products are in

the process of being proposed at this time.

Section 323(a)(2) of the Act requires FEA to direct the National Bureau of Standards Act (NBS) to develop for 13 types of covered products test procedures for the determination of the estimated annual operating costs and at least one other useful measure of energy consumption which FEA determines is likely to assist consumers in making purchasing decisions. Pursuant to the Act, FEA directed NBS to develop test procedures for FEA's use in prescribing test procedures under the Act. As part of this undertaking, NBS was required to evaluate existing test procedures for measuring energy consumption of clothes dryers.

NBS has transmitted to FEA a test procedure review document which reviewed existing test procedures for measuring energy consumption for clothes dryers and recommended test procedures. Copies of this review document will be made available for inspection by interested persons as provided for later in this notice. A recommended clothes dryer test procedure was published in the FEDERAL REGISTER on December 12, 1975, under the Department of Commerce Voluntary Labelling Program. The proposed procedure was based on industry standard HLD-2EC, which is the Association of Home Appliance Manufacturer's (AHAM) standard for calculating the energy consumption of clothes dryers. The test procedures recommended to FEA by NBS and proposed today incorporate the approach contained in the AHAM Standard HLD-2EC for measuring energy consumption and, in addition, include procedures for determining the estimated annual operating costs and energy efficiency for clothes dryers.

B. MEASURES OF ENERGY CONSUMPTION

The Act requires FEA to prescribe test procedures for the determination of estimated annual operating costs and at least one other measure of energy consumption which the Administrator determines is likely to assist consumers in making purchasing decisions. Since the annual operating cost of clothes dryers differs significantly depending on whether they are fueled by electricity or natural gas, FEA is proposing to establish two alternate values for the estimated annual operating cost for clothes dryers: One assuming that electricity is used as a fuel and the other assuming natural gas is used as a fuel. In each case, the estimated annual operating cost is the product of the representative average-use cycle times the cost of energy used for the cycle.

An additional proposed measure that is likely to assist consumers in making purchasing decisions is the energy factor, which is defined as the quotient of a load of clothes divided by the energy consumption per cycle. Among other possible applications, the energy factor may be used by FEA to determine the efficiency of clothes dryers for the purposes of the efficiency improvement program described by section 325 of the Act.

FEA recognizes that there may be additional useful measures of energy consumption for clothes dryers other than the measures described above. Accordingly, today's proposal, in proposed § 430.22(d)(4), provides for other useful measures which the Administrator determines are likely to assist consumers in making purchasing decisions. These measures, however, must be derived from the application of the uniform test method proposed today as Appendix D to Subpart B. Clothes dryer manufacturers would, if required, only have to perform various computations while still applying only the same test method contained in Appendix D. For example, if the Administrator determined that annual energy consumption for clothes dryers would aid consumers in making purchasing decisions, this energy consumption could be derived by applying the uniform test method and dividing the the annual operating cost by the cost of energy to arrive at an annual energy consumption figure.

C. LABORATORY METHODOLOGY

Proposed Appendix D to Subpart B provides for a controlled laboratory environment for measuring energy consumption of clothes dryers for a test cycle that correlates with typical consumer usage. One aspect of this test procedure is the selection of an appropriate load. A field survey conducted by Proctor and Gamble on washer loads concluded that the average washer load was 5.8 pounds (dry weight). Based on this report and other available information, NBS recommended a 7-pound load for the purposes of the proposed test procedures for clothes dryers. The 7-pound load also conforms with the test load utilized in AHAM Standard HLD-2EC. The AHAM test procedure also provides for the testing of a 3-pound load in compact dryers. Both the 7-pound load for standard dryers and 3-pound load for compact dryers have been included in the proposed test procedures.

Another consideration is the material used as the test load. At a public hearing held by FEA in Washington, D.C., on June 2, 1976, concerning proposed appliance energy efficiency targets for clothes washers, General Electric Company estimated that in an average washer load, the ratio of natural fiber to synthetic fiber was approximately 50 percent. The proposed test procedures incorporate this figure by providing for the use of test cloth made of a blend of equal portions of synthetic and cotton material.

The load itself consists of swatches of test material cut and hemmed into specified sizes. The use of a standard test load serves to eliminate test to test variability caused by garment seams, garment twisting, and fabric textures and thus provides good repeatability in the test program.

The energy consumption of a dryer is determined by loading a dryer with a test load containing a known quantity of water and measuring the energy necessary to remove a specified amount of this water. The proposed test procedure would use a test load to which a quantity of water equal to 70 percent of the dry weight of the test load has been added. The test load is dried until the moisture content of the test load is reduced to between 2.5 and 5.0 percent of the dry weight of the test load and the energy consumed is then recorded. NBS laboratory tests have shown that an acceptable level of dryness is achieved when the moisture content of the test load is 4 percent of the dry weight of the test load. This corresponds to the removal of a quantity of water equal to 66 percent of the dry weight of the test load. The proposed regulations should specify this 66 percent value as the reference point for the energy used by a dryer during a test. Since under actual test conditions a quantity of water slightly smaller or larger than 66 percent of the dry weight of the test load will be removed, actual energy consumption measurements must be adjusted to reflect the energy which would have been consumed if the 66 percent value had been achieved. This adjustment is made by multiplying the energy consumed during the test by the ratio of the desired level of moisture removal (66 percent) to the actual amount moisture removed during the test.

Ideally, laboratory test results for energy consumption should be quite close to the actual energy consumed per cycle in the field. A survey conducted by Oklahoma Gas and Electric Company of 64 homes demonstrated that in drying 33,000 loads of clothes, an average of 2.5 kilowatt hours (Kwh's) of electricity was used per load. A limited number of NBS tests using the proposed test procedures has shown that the proposed test load requires 2.1 Kwh's per load or approximately 20 percent less than that used under actual home use condition. In order to assure that the laboratory test procedures produce results representative of actual use, the test results are multiplied by a factor of 1.2.

D. REPRESENTATIVE AVERAGE-USE CYCLE

Section 323(b)(2) (42 U.S.C. 6293 (b)(2) of the Act provides that test procedures for determining estimated annual operating costs of any covered product shall be calculated from measurements of energy use in a representative average-use cycle (as determined by the Administrator) and from representative average unit costs (as provided by the Administrator) needed to operate such product during such cycle.

FEA has determined that the representative average use cycle for clothes dryers is 416 cycles per year. This determination is based upon NBS' recommendation to FEA, which in turn, is based upon a Proctor and Gamble field study reporting 7.8 washer loads per week. NBS' recommendation and the Proctor and Gamble field study are available for inspection as provided for later in this notice.

FEA intends to develop representative average unit costs of energy needed to calculate the annual operating cost for the representative average-use cycle and to provide this information to manufacturers and FTC on or before the effective date of test procedures for clothes dryers.

E. NUMBER OF UNITS TO BE TESTED

Proposed § 430.23(d) would provide for sampling of each basic model to be tested when testing of clothes dryers is required by the Act or by program regulations of agencies responsible for administering the Act. This provision is intended both to provide an acceptable level of assurance that test results are applicable to any entire basic model for which testing is required and to minimize the testing burden on manufacturers. FEA believes that the sampling approach proposed today will enable consumers to make meaningful comparisons of information appearing on appliance labels, and also will meet the requirements of section 323(b) of the Act that test procedures not be unduly burdensome to conduct.

Under proposed § 430.23(d), a sample of sufficient size of each basic model would be tested to assure that, for each measure of energy consumption described in § 430.22(d), there is a 95 percent probability that the mean of the values of these measures of the sample is within 5 percent of the true mean of these measures of the basic model. The size of the sample of a particular basic model will depend upon the following factors:

(a) The level of confidence required (set at 95 percent in the proposed regulations);

(b) The maximum allowable difference between the sample mean and the mean of the basic model (expressed in the proposal as a percent of the true mean and set at 5 percent); and

(c) The relationship of the mean and standard deviation of the basic model.

The relationship of the mean and standard deviation of the basic model can be determined from data available to manufacturers. With this information and using standard statistical techniques, manufacturers can determine the number of units required to be tested. In any case, no fewer than three units of each basic model must be tested. Sample units would be selected randomly from the production stream.

Manufacturers and other interested persons are encouraged to comment on the sampling approach. Manufacturers are especially encouraged to submit any data which relates to the size of the samples which the provision would require to be tested. Comments alleging that the sampling provision is burdensome should include a full discussion of the facts upon which such allegation is based.

F. REQUEST FOR PARTICULAR COMMENTS

While FEA is soliciting comments on all aspects of the proposed test procedures for clothes dryers FEA is particularly interested in receiving comments on any other useful measures of energy consumption or data on typical consumer usage of clothes dryers in addition to those proposed today.

The proposed test procedure measures energy consumption and provides data that can be used for comparison purposes, but the actual result of the drying performance and energy consumption utilizing the dryness controls is not measured. Comments are requested addressing the potential modification of the proposed test procedure to include measuring the effect of user-timed dryness controls or automatically-timed dryness controls on energy consumption.

Comments are also requested concerning the size of the clothes dryer test load. Clothes dryer laboratory test data, consumer usage data, and related comments are desired.

In addition, FEA is interested in receiving comments on definitions in previously proposed § 430.2, as these provisions might affect the testing of clothes dryers. Comments with respect to clothes dryers regarding provisions in previously proposed § 430.2 are timely until the close of the written record.

For the convenience of the reviewer, the proposed definitions of "electric clothes dryer" and "gas clothes dryer" (41 FR 19979, May 14, 1976) are as follows:

Section 430.2 *Definitions.*

* * * * *

"Electric clothes dryer" means a cabinet-like appliance designed to dry fabrics in a tumble type drum with forced air circulation. The heat source is electricity and the drum and blowers are driven by an electric motor(s).

* * * * *

"Gas clothes dryer" means a cabinet-like appliance designed to dry fabrics in a tumble type drum with forced air circulation. The heat source is gas and the drum and blowers are driven by an electric motor(s).

G. COMMENT PROCEDURES

1. WRITTEN COMMENTS

Interested persons are invited to participate in this rulemaking by submitting data, views or arguments with respect to the proposed test procedures for clothes dryers set forth in this notice to Executive Communications, Room 3309, Federal Energy Administration, Box LX, Washington, D.C. 20461.

Comments should be identified on the outside of the envelope and on documents submitted to FEA with the designation "Clothes Dryers—Proposed Test Procedures." Fifteen copies should be submitted. All comments received by June 15, 1977, before 4:30 p.m., e.s.t., and all other relevant information, will be considered by FEA before final action is taken on the proposed regulations.

Any information or data considered by the person furnishing it to be confidential must be so identified and submitted in writing, one copy only. FEA reserves the right to determine the confidential status of the information or data and treat it according to its determination.

2. PUBLIC HEARINGS

a. *Request procedure.* The time and place of the public hearing are indicated at the beginning of this preamble.

FEA invites any person who has an interest in the proposed rulemaking issued today, or who is a representative of a group or class of persons that has an interest in today's proposed rulemaking, to make a written request for an opportunity to make an oral presentation. Such a request should be directed to the address indicated at the beginning of this preamble and must be received before 4:30 p.m., e.s.t., on May 31, 1977. Such a request may be hand delivered to such address, between the hours of 8 a.m. and 4:30 p.m., Monday through Friday. A request should be labeled both on the document and on the envelope "Clothes Dryers—Proposed Test Procedures."

The person making the request should briefly describe the interest concerned; if appropriate, state why she or he is a proper representative of a group or class of persons that has such an interest; and give a concise summary of the proposed oral presentation and a telephone number where she or he may be contacted through June 12, 1977.

FEA will notify, before 4:30 p.m., June 2, 1977, each person selected to appear at a hearing. Each person selected to be heard must submit 50 copies of her or his statement to the address and by the date given in the beginning of this preamble. In the event any person wishing to testify cannot meet the 50 copy requirement, alternative arrangements can be made with the Office of Regulations Management in advance of the hearing by so indicating in the letter requesting an oral presentation or by calling the Office of Regulations Management at (202) 254–3345.

b. *Conduct of hearings.* FEA reserves the right to select the persons to be heard at this hearing, to schedule their respective presentations and to establish the procedures governing the conduct of the hearing. The length of each presentation may be limited, based on the number of persons requesting to be heard.

An FEA official will be designated to preside at the hearing. This will not be a judicial or evidentiary-type hearing. Questions may be asked only by those conducting the hearing, and there will be no cross-examination of persons presenting statements. Any decision made by FEA with respect to the subject matter of the hearing will be based on all information available to FEA. At the conclusion of all initial oral statements, each person who has made an oral statement will be given the opportunity if she or he so desires, to make a rebuttal statement. The rebuttal statements will be given in the order in which the initial statements were made and will be subject to time limitations.

Any interested person may submit questions to be asked of any person making a statement at the hearing to Executive Communications, FEA, before 4:30 p.m., e.s.t., June 9, 1977. FEA will determine whether the question is relevant, and whether the time limitations permit it to be presented for answer.

Any person who makes an oral statement and who wishes to ask a question at the hearing may submit the question, in writing, to the presiding officer. The presiding officer, will determine whether the question is relevant, and whether the time limitations permit it to be presented for answer.

Any further procedural rules needed for the proper conduct of the hearing will be announced by the presiding officer.

A transcript of the hearing will be made and the entire record of the hearing, including the transcript, will be retained by FEA and made available for inspection at the FEA Freedom of Information Office, Room 2107, Federal Building, 12th and Pennsylvania Avenue NW., Washington, D.C., between the hours of 8 a.m. and 4:30 p.m., Monday through Friday. Any person may purchase a copy of the transcript from the reporter. A copy of NBS' recommendations concerning test procedures for clothes dryers along with related NBS field study results and a Proctor and Gamble field study will also be made available for inspection at the FEA Freedom of Information Office.

H. Environmental and Inflationary Review

As required by section 7(c)(2) of the Federal Energy Administration Act of 1974 (Pub. L. 93–275), a copy of this notice has been submitted to the Administrator of the Environmental Protection Agency for his comments concerning the impact of this proposal on the quality of the environment. The Administrator has no comments.

The National Environmental Policy Act of 1969 requires FEA to assess the environmental impacts of any proposal by the Agency for "major Federal actions significantly affecting the quality of the human environment." Since test procedures under the conservation program for appliances will be used only to standardize the measurement of energy usage and will not affect the quantity or distribution of energy usage, FEA has determined that the action of prescribing test procedures, by itself, will not result in any environmental impacts. On this basis, FEA has determined that, with respect to prescribing test procedures under the conservation program for appliances, no environmental impact statement is required.

The proposal has been reviewed in accordance with Executive Order 11821 as amended by Executive Order 11949, and OMB Circular No. A–107 and has been determined not to be a major proposal requiring evaluation of its economic impact as provided for therein.

(Energy Policy and Conservation Act, Pub. L. 94–163, as amended by Pub. L. 94–385; Federal Energy Administration Act of 1974, Pub. L. 93–275, as amended by Pub. L. 94–385; E.O. 11790, 39 FR 23185.)

In consideration of the foregoing, it is proposed to amend Chapter II of Title 10, Code of Federal Regulations, as set forth below.

Issued in Washington, D.C., April 21, 1977.

Eric J. Fygi,
Acting General Counsel,
Federal Energy Administration.

1. Section 430.2 is amended by adding paragraph (4) as part of the definition of "Basic model", to read as follows:

§ 430.2 Definitions.

* * * * *

"Basic model" means all units of a given type of covered product manufactured by one manufacturer and—

* * * * *

(4) With respect to clothes dryers, having essentially identical functional, physical and electrical characteristics."

* * * * *

2. Section 430.22 is amended by adding a paragraph (d), to read as follows:

§ 430.22 Test procedures for measures of energy consumption.

* * * * *

(d) *Clothes dryers.* (1) The estimated annual operating cost for clothes dryers shall be—

(i) For an electric clothes dryer, the product of the following three factors: (A) A representative average-use cycle of 416 cycles per year, (B) the total per-cycle energy consumption in kilowatt-hours per-cycle, determined according to 4.1 of Appendix D of this subpart, and (C) the representative average unit cost in dollars per kilowatt-hour as provided by the Administrator, the resulting product then being rounded off to the nearest dollar per year, and

(ii) For a gas clothes dryer, the product of the representative average-use cycle of 416 cycles per year times the sum of (A) the product of the gas dryer electric per-cycle energy consumption in kilowatt-hours per cycle, determined according to 4.2 of Appendix D of this subpart, times the representative average unit cost in dollars per kilowatt-hour as provided by the Administrator plus (B) the product of the total gas dryer gas energy consumption per cycle, in Btu's per cycle, determined according to 4.5 of Appendix D of this subpart, times the representative average unit cost in dollars per Btu as provided by the Administrator, the resulting product then being rounded off to the nearest dollar per year.

(2) The energy factor, expressed in pounds per kilowatt-hour, for clothes dryers shall be the quotient of one load of clothes, as defined by 2.6 of Appendix D of this subpart, divided by the clothes dryer energy consumption per cycle, as determined according to 4.1 for electric clothes dryers and 4.6 for gas clothes dryers of Appendix D of this subpart, the resulting quotient then being rounded off to the nearest .01.

(3) Other useful measures of energy consumption for clothes dryers shall be those measures of energy consumption for clothes dryers which the Administrator determines are likely to assist consumers in making purchasing decisions and which are derived from the application of Appendix D of this subpart.

* * * * *

3. Section 430.23 is amended by adding a paragraph (d), to read as follows:

§ 430.23 Units to be tested.

* * * * *

(d) *Clothes dryers.* (1) When testing of clothes dryers is required for a measure or measures of energy consumption described in § 430.22(d), a sample of sufficient size of each basic model shall be tested to ensure that, for each such measure of energy consumption, there is a 95 percent probability that the mean of the sample is within five percent of the true mean of such measures of the basic model, except that no fewer than three units of each basic model shall be tested.

(2) The sample selected for paragraph (d)(1) of this section shall be a simple random sample drawn from the production stream of the basic model being tested.

(3) A basic model having dual voltage ratings shall be separately tested at each design voltage such that the requirements of paragraph (d)(1) of this section are satisfied at each rating.

* * * * *

4. Subpart B of Part 430 is amended to add an Appendix D, to read as follows:

Appendix D—Uniform Test Method for Measuring the Energy Consumption of Clothes Dryers

1. Definitions

1.1 "AHAM" means the Association of Home Appliance Manufacturers.

1.2 "Bone Dry" weight refers to test cloth which has been dried until the weight change between measurements is less than 1 percent.

1.3 "Compact" refers to a clothes dryer with a drum capacity of less than 4.4 cubic feet.

1.4 "Cool Down" refers to the portion of the clothes drying cycle when the added gas or electric heat is terminated and the clothes continue to tumble and dry within the drum.

1.5 "Cycle" means a sequence of operations of a clothes dryer which performs a clothes drying operation, and may include variations or combinations of the functions of heating, tumbling and drying.

1.6 "Drum Capacity" means the volume of the drying drum in cubic feet.

1.7 "HLD–1" refers to the test standard promulgated by AHAM and titled "AHAM Performance Evaluation Procedure for Household Tumble Type Clothes Dryers", June, 1974 and designated as HLD–1.

1.8 "HLD–2EC" refers to the test standard promulgated by AHAM and titled "Test Method for Measuring Energy Consumption of Household Tumble Type Clothes Dryers," December, 1975, and designated as HLD–2EC.

1.9 "Standard Size" refers to a clothes dryer with a drum capacity of at least 4.4 cubic feet.

1.10 "Moisture content" refers to the amount of water contained by a test load expressed as a percent of the bone-dry weight of the test load.

2. Testing Conditions

2.1 *Installation.* Install the clothes dryer in accordance with manufacturer's instructions. The dryer exhaust shall be restricted by adding the AHAM exhaust simulator described in 3.3.5 of HLD–1. All external joints should should be taped to avoid air leakage.

2.2 *Ambient temperature and humidity.* Maintain the room ambient air temperature between 72°F and 78°F and the room relative humidity at 45 percent to 55 percent relative humidity.

2.3 *Energy supply.*

2.3.1. *Electrical supply.* Maintain the electrical supply to the clothes dryer within 1 percent of the nameplate voltage.

2.3.2 *Gas supply.*

2.3.2.1 *Natural Gas.* Maintain the gas supply to the clothes dryer with a normal inlet test pressure immediately ahead of all controls at 7 to 10 inches of the water column. The regulator outlet pressure at normal test pressure shall be approximately that recommended by the manufacturer. Adjust the burner to its Btu rating at normal inlet test pressure. Any adjustment shall be within ±2 percent of the hourly Btu rating specified by the manufacturer. The natural gas supplied should have a heating value of approximately 1,025 Btu's per standard cubic foot. Determine the actual heating value, in Btu's per standard cubic foot, for the natural gas to be used in the test, with an error no greater than 1 percent, and use that value for all calculations included herein.

2.3.2.2 *Propane gas.* Maintain the gas supply to the clothes dryer with a normal inlet test pressure immediately ahead of all controls at 11 to 13 inches of the water column. The regulator outlet pressure at normal test pressure shall be approximately that recommended by the manufacturer. Adjust the burner to its Btu rating at normal inlet test pressure. Any adjustment shall be within ±2 percent of the hourly Btu rating specified by the manufacturer. The propane supplied should have a heating value of approximately 2,500 Btu's per standard cubic foot. Determine the actual heating value, in Btu's per standard cubic foot, for the natural gas to be used in the test, with an error no greater than 1 percent, and use that value for all calculations included herein.

2.3.3 *Energy flow instrumentation.* Install one or more energy flow instruments which measure, as appropriate, and with an error no greater than 1 percent, the quantity of electrical energy, natural gas flow or propane flow.

2.4 *Lint trap.* Clean the lint trap thoroughly before each test run.

2.5 *Test cloths.*

2.5.1 *Energy test cloth.* The energy test cloth shall consist of the following:

(a) Pure finished bleached cloth, made with a momie or granite weave, which is 50 percent cotton and 50 percent polyester and wighs 5.75 ounces per square yard and has 65 ends on the warp and 57 picks on the fill.

(b) The cloth shall be hemmed 22" x 34" before washing and the maximum shrinkage after 5 washes shall be not more than 4 percent on the length and width.

2.5.2 *Energy stuffer cloths.* The energy stuffer cloths shall be made from energy test cloth material and consist of hemmed 10" x 10" cloths made from 12" x 12" material.

2.6 *Test loads.*

2.6.1 *Compact dryer load.* Prepare a 3 pound (±1 percent) bone-dry load of energy test cloths. Adjustments to the 3 pound weight can be made with energy stuffer cloths. Dampen the load by agitating in 100°F (±5°F) water of 0 to 17 parts per million hardness for approximately 2 minutes to saturate the fabric, and then extract water by spinning the load to a moisture content of 70 percent (±5 percent) of the bone dry weight of the test load.

2.6.2 *Standard size dryer load.* Prepare a 7 pound (±1%) bone dry load of energy test cloths. Adjustments to the 7 pound weight can be made with energy stuffer cloths. Dampen the load by agitating in 100°F (±5°F) water of 0 to 17 parts per million hardness for approximately 2 minutes to saturate the fabric, and then extract water by spinning the load to a moisture content of 70% (±5%) of the bone dry weight of the test load.

2.6.3 *Method of loading.* Load energy test cloth by grasping them in the center, shaking them to hang loosely and drop them in the dryer at random.

3. TEST PROCEDURES AND MEASUREMENTS

3.1 *Drum capacity.* Measure the drum capacity by sealing all openings in the drum except the loading port with a plastic bag, making sure that all corners and depressions are filled. Then, with the dryer laid on its back on a platform scale, record the weight of the empty dryer and fill the drum with water (measure the water temperature) to a level determined by the intersection of the door plane and the loading port. Measure the weight of the dryer with added water and determine the mass of the water in pounds within 1 percent accuracy. The drum capacity is calculated as follows:

$$C=\frac{w}{d}$$

C=capacity in cubic feet
w=mass of water in pounds
d=density of water at the measured temperature in pounds per cubic feet.

3.2 *Dryer loading.* Load the dryer as specified in 2.6.

3.3 *Test cycle.*

3.3.1 *Dryers controlled by timers.* For dryers controlled by timers, operate at maximum time and maximum temperature setting and dry the load to 2.5 percent to 5 percent moisture content, but do not permit dryer to advance into cool down.

3.3.2 *Dryers equipped with automatic dry controls without timer.* For dryers equipped with automatic dry controls without timer, operate at maximum temperature setting and dry the load to 2.5 percent to 5 percent moisture content, but do not permit dryer to advance into cool down.

3.3.3 *Dryers without timer or automatic dry control.* For dryers without timer or automatic dry control, operate at maximum temperature and dry the load to 2.5 percent to 5 percent moisture content, but do not permit dryer to advance into cool down.

3.4 *Data recording.* Record for each test cycle:

3.4.1 Test load bone dry weight within ±1 percent described in 2.6.

3.4.2 Moisture content of the wet test load as prepared in 2.6 within ±1 percent.

3.4.3 Moisture content of the dry test load within ±1 percent after the test described in 3.3.

3.4.4 Test room conditions, temperature and relative humidity described in 2.2.

3.4.5 For electric dryers—the total kilowatt-hours of energy consumed during test described in 3.3.

3.4.6 For gas dryers:

3.4.6.1 Total kilowatt-hours of electric energy consumed during test described in 3.3.

3.4.6.2 Cubic feet of gas consumed during test described in 3.3.

3.4.6.3 On gas dryers using a standing pilot, cubic feet of gas consumed by the gas pilot in 1 hour.

3.4.6.4. As the heat content of natural gas, approximately 1,025 Btu/cubic foot, varies depending on the source, calculate the corrected gas heat value, GEF, to standard pressure and temperature conditions in accordance with U.S. Bureau of Standards, Circular C417, 1938. A sample calculation is illustrated in Appendix E of HLD–1.

3.5 *Reported values.* State the reported values of the data described in 3.4.

4. CALCULATION OF DERIVED RESULTS FROM TEST MEASUREMENTS

4.1 *Total per-cycle electric dryer energy consumption.* Calculate the energy consumption per cycle, E_{ce}, expressed in kilowatt-hours per cycle and defined as:

$$E_{ce}=\frac{66}{(W_w-W_d)\times 100}\times E_t\times FU$$

E_t=the energy recorded in 3.4.5.
66=an experimentally established value for the percent water removed from a laboratory test cycle.
FU=Field use factor=1.2.
W_w=the moisture content of the wet test load recorded in 3.4.2.
W_d=the moisture content of the dried test load as recorded in 3.4.3.

4.2 *Per-cycle gas dryer electrical energy consumption.* Calculate the gas dryer electrical energy consumption per cycle, E_{te}, expressed in kilowatt-hours per cycle and defined as:

$$E_{te}=\frac{66}{(W_w-W_d)\times 100}\times E_{te}\times FU$$

E_{te}=the energy recorded in 3.4.6.1.
FU, 66, W_w, W_d as defined in 4.1.

4.3 *Per-cycle gas dryer gas energy consumption.* Calculate the gas dryer gas energy consumption per cycle, E_{tt}, expressed in Btu's per cycle and defined as:

$$E_{tt}=\frac{66}{(W_w-W_d)\times 100}\times E_{tg}\times FU\times GEF$$

E_{tg}=the energy recorded in 3.4.6.2.
GEF=corrected gas heat value (Btu/cubic feet) as defined in 3.4.6.4.
FU, 66, w_w, w_d as defined in 4.1.

4.4 *Per-cycle gas dryer standing pilot gas energy consumption.* Calculate the gas dryer standing pilot gas energy consumption per cycle, E_{sp}, expressed in Btu's per cycle and defined as:

$$E_{sp}=E_{pt}\times\frac{8{,}760}{416}\times GEF$$

E_{pt}=the energy recorded in 3.4.6.3.
8,760=number of hours in a year.
416=average number of clothes dryer cycles in a year.
GEF as defined in 4.3.

4.5 *Total per-cycle gas dryer gas energy consumption expressed in Btu's.* Calculate the total gas dryer energy consumption per cycle, E_t, expressed in Btu's per cycle and defined as:

$$E_t=E_{tt}+E_{sp}$$

E_{tt} as defined in 4.3.
E_{sp} as defined in 4.4.

4.6 *Total per-cycle gas dryer energy consumption expressed in kilowatt-hours.* Calculate the total gas dryer energy consumption per cycle, E_{te}, expressed in kilowatt-hours per cycle and defined as:

$$E_{te}=E_{te}+\frac{E_t}{3{,}412\ \text{Btu/kWh}}$$

E_{te} as defined in 4.2.
E_t as defined in 4.5.

[FR Doc.77-11985 Filed 4-21-77;5:00 pm]